ARCHITECTURAL RECORD

JULY 1950

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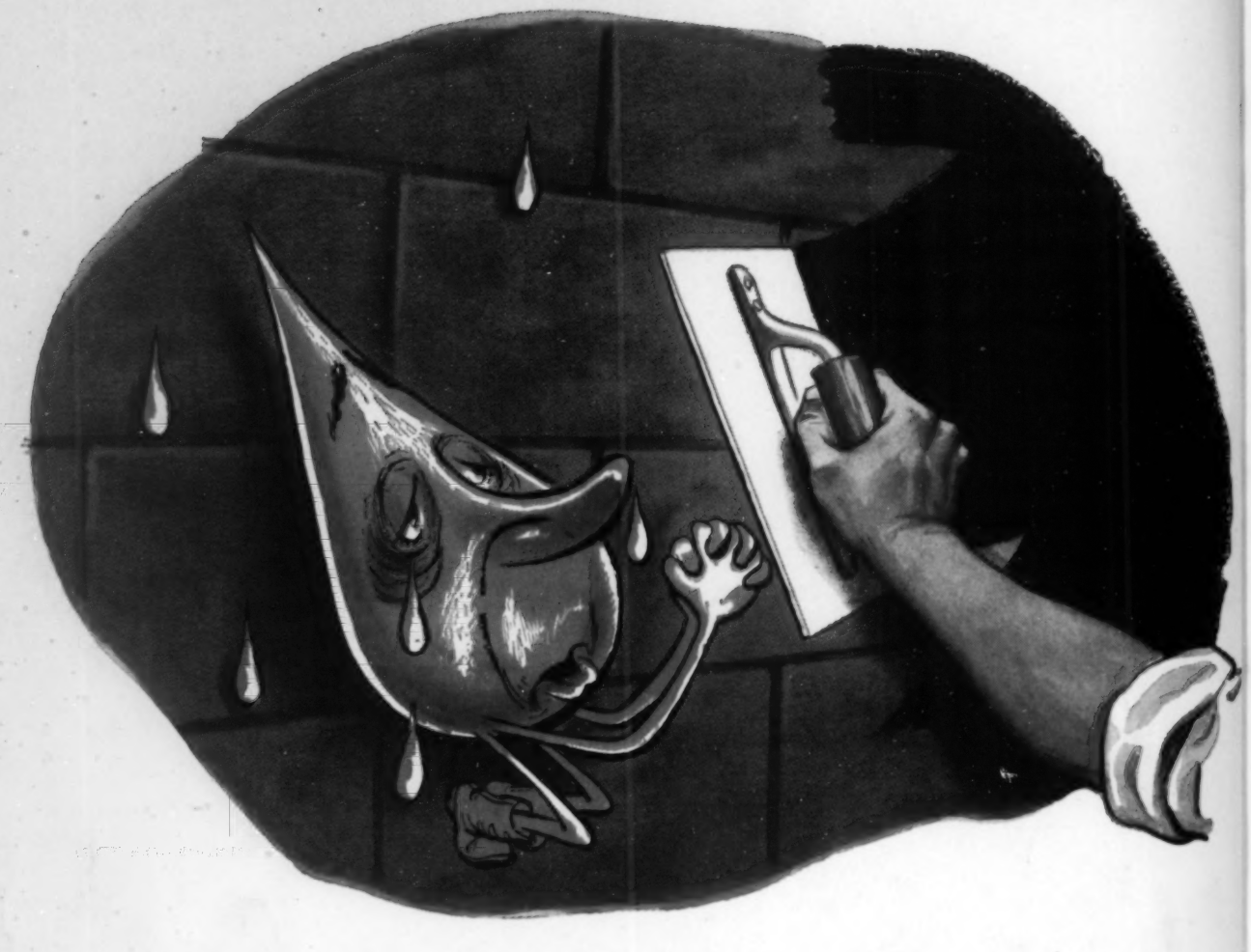

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Entered as second class matter at the Post Office, Concord, N. H., March 16, 1946, under the Act of March 3, 1879.

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ARCHITECTURAL RECORD

Vol. 108 · No. 1 *July 1950*

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Architectural Record (combined with American Architect and Architecture) is published monthly by F. W. Dodge Corporation, 10 Ferry St., Concord, N. H., with Editorial and Executive Offices at 119 West 40th Street, New York, N. Y. Western Editorial Office, 2813 Channing Way, Berkeley, Calif. Thomas S. Holden, Pres.; Howard J. Barringer, Vice-Pres. and Treas.; Irving W. Hadsell, Vice-Pres.; Chauncey L. Williams, Vice-Pres.; Sanford D. Stockton, Jr., Secy.; Walter F. De Saix, Asst. Treas.; Edwin H. Freed, Asst. Treas.; Irving B. Satin, Asst. Treas. Member Audit Bureau of Circulation and Associated Business Papers Inc. Architectural Record is indexed in Reader's Guide, Art Index, Industrial Arts Index and Engineering Index. Subscription rates: United States and Possessions, Canada, Cuba, Mexico, Central and South America, and Spain, $4.50 the year, $7.50 for two years, $9 for three years; elsewhere, $6.50 the year, $11.50 for two years, $15 for three years. Single copy $1. Circulation Manager: Marshall T. Ginn. Every effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage. Other Dodge Services: Real Estate Record & Builders' Guide, Sweet's Files, Home Owners' Catalog, Dodge Reports & Dodge Statistical Research Service.

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Whiting Research Facilities for Standard Oil, Whiting, Ind. Holabird & Root & Burgee, Architects. Hedrich-Blessing Studio Photo.

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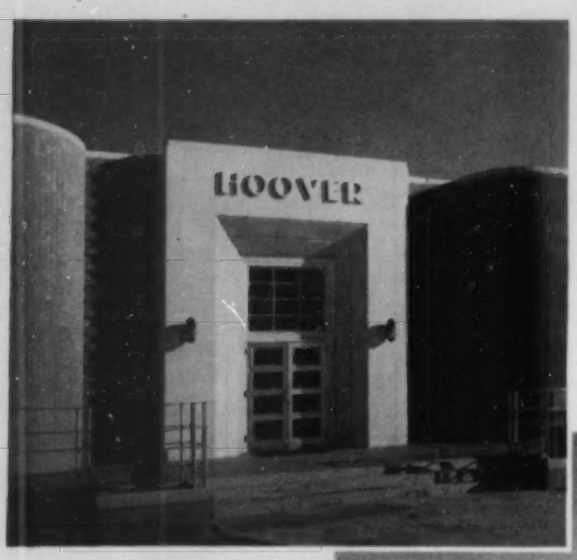

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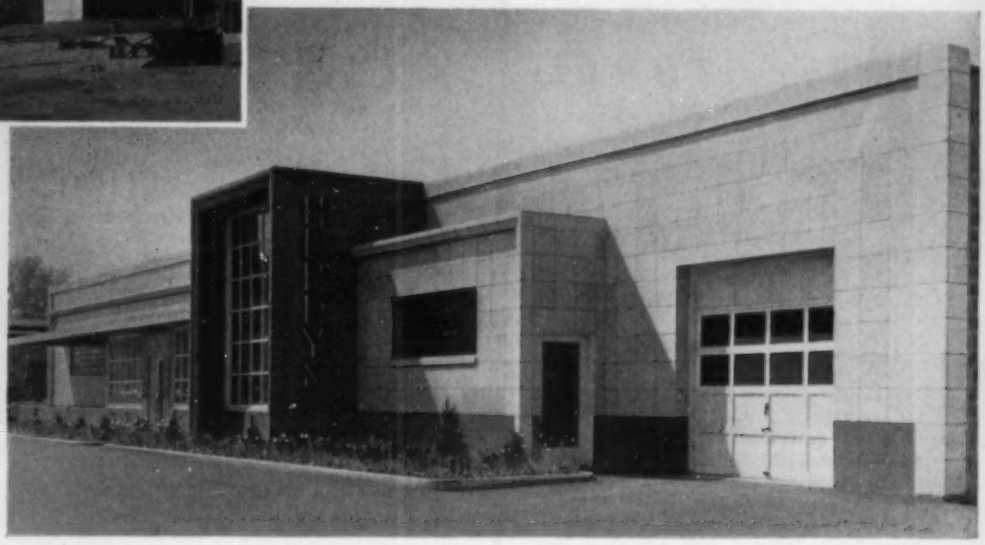

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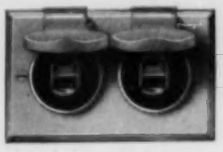

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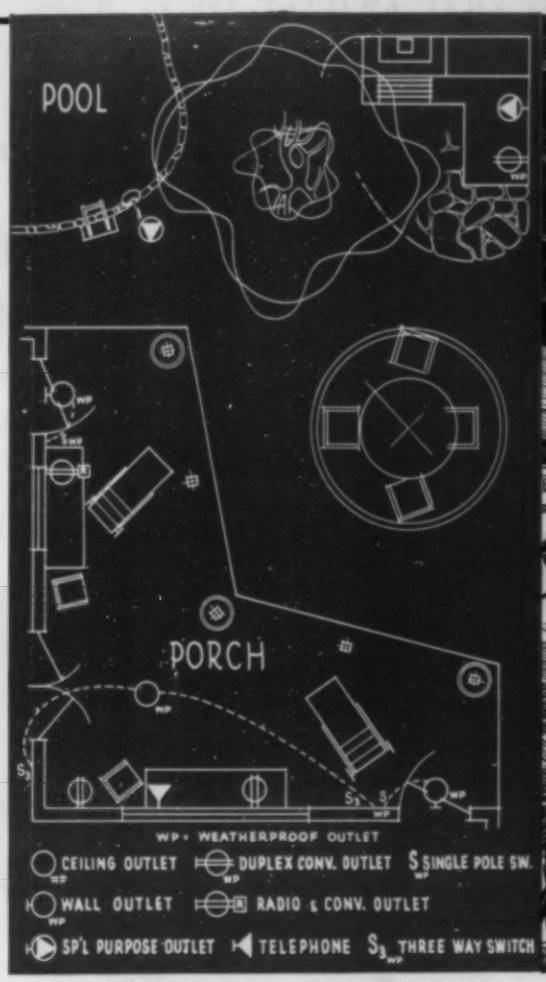

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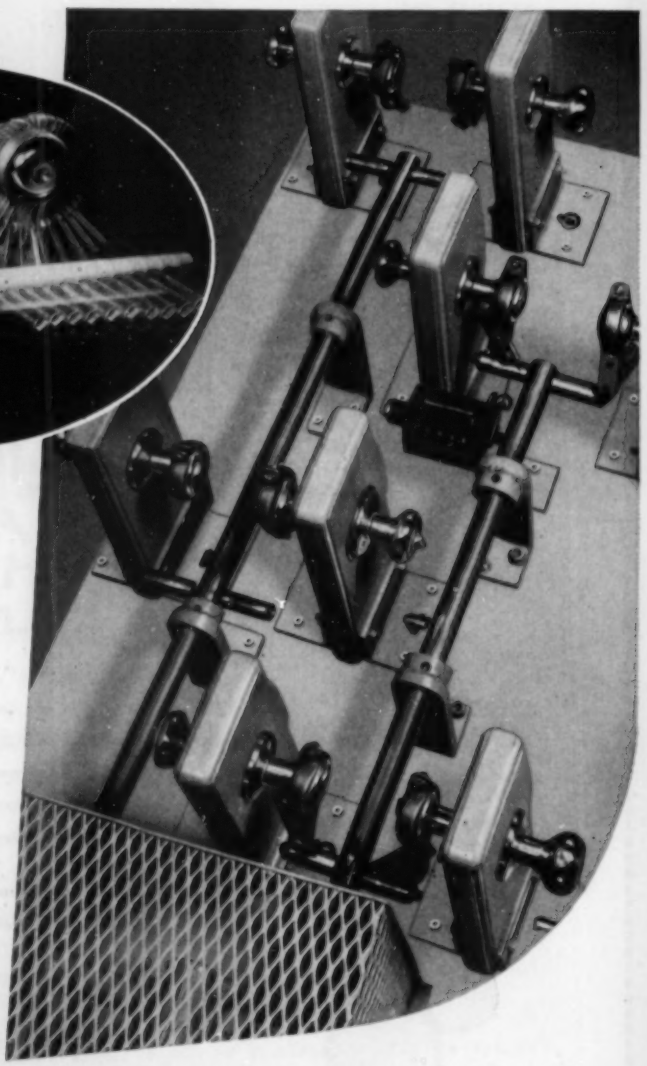

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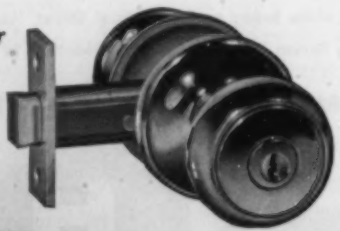

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THE RECORD REPORTS

NICHOLS & BUTTERFIELD AWARDED CONTRACT ON PRIZE NEW HAMPSHIRE OFFICE BUILDING

FOR THE FIRST TIME in the state's history, New Hampshire will have a competition-designed state office building — the new quarters for the State Highway Department, Motor Vehicle Department, and State Police Department in Concord.

Nichols & Butterfield, James F. Russell and Bruce Graham Associated, of West Hartford, Conn., submitted the winning design (see perspective below) in a competition which was open to all architects registered in New Hampshire.

The contract for architectural services was awarded to Nichols & Butterfield a few days after a jury headed by Architect Caleb Hornbostel of New York had selected the three prize winners. Other members of the jury were Prof. Hugh Morrison of Dartmouth College and Harold D. Hauf, editor-in-chief, ARCHITECTURAL RECORD. Lawrence B. Anderson of the Department of Architecture, Massachusetts Institute of Technology, was the professional adviser for the competition.

Edgar H. Hunter Jr. and Margaret K. Hunter of Hanover, N. H., were awarded the $500 second prize and the third prize of $250 went to Aaron N. Kiff, c/o York & Sawyer, New York, N. Y. The first prize of $1000 is deductible from the architectural contract.

The jury report indicated some difficulty in choosing between the first two prize winners and that the decisive factor may have been the feeling that a three-story building will be better suited than a two-story building to the site, with its low elevation in relation to the surrounding highways.

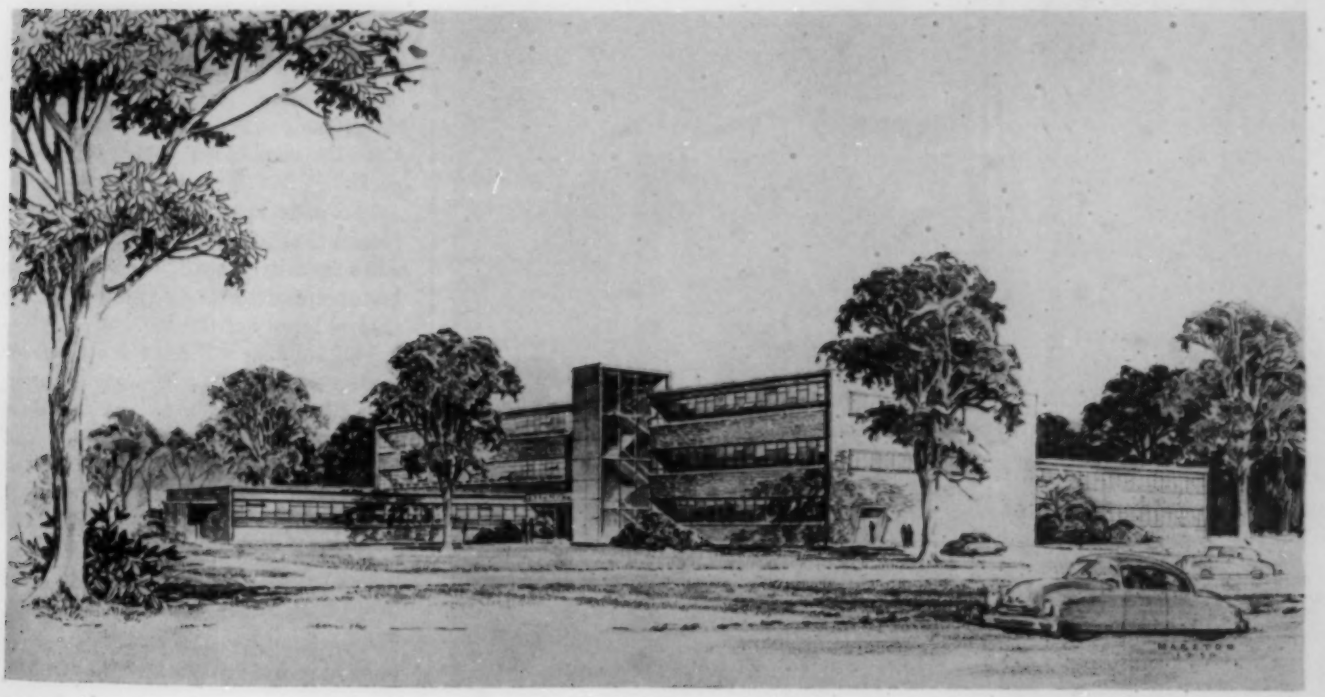
Competitors were required to design, "with emphasis on economy, efficiency and flexibility," a building of not more than 640,000 cu ft to house the Highway Department, with a staff of 152 in 10 subdivisions; the Motor Vehicle Department, with a staff of 50 in five divisions; and the State Police Department, with a staff of 20 in two divisions. Net areas required for each department were listed by the program in sq ft, and numbers of public visitors to each of the divisions expected each week were listed also. Major equipment needs (including files, work tables, etc.) also were specified for the various offices of the building in an unusually complete and detailed program. The economy factor was underlined by the advice that the State Legislature had appropriated $575,000 for the entire cost of the project, including mechanical equipment, site work, professional fees and the cost of conducting the competition.

Fifty-two of the 108 registered architects eligible applied for the competition

Modular Experience Data Sought for A.I.A. Research

William Demarest Jr., newly appointed Secretary for Modular Coordination in the Department of Education and Research of The American Institute of Architects, wants to know about architects' past experience with modular coordination.

Architects who have prepared plans on the basis of modular coordination are invited to communicate with Mr. Demarest at the offices of The A.I.A., 1741 New York Ave., N. W., Washington 6, D. C.



program, and 29 designs were submitted.

The jury reported that it considered "both first and second prize designs of outstanding architectural quality, carefully studied in all details of a complex program, and skillful and effective in their solution." The report also notes that "the second-prize design in the opinion of the jury closely rivalled the first prize design in quality."

In discussing the use of site, the jury report suggests a possible basis for the final choice. Of the Nichols & Butterfield design, the report says:

"The design makes effective use of the site, considered both in relationship to the approach to Concord from the East and in relationship to its immediate surroundings. It would look well from the thruway and traffic circle, along which most spectators and visitors will travel, and location of both main entrance and police entrance would be immediately visible from the thruway approach. . . . The importance of the building relative to the State Highway Garage is signalized by its greater height."

While the jury found the Hunter & Hunter plot plan "excellent," the report states the jury felt that "the building would not immediately make clear the location of its main entrances to visitors approaching along the thruway and traffic circle. . . . It was felt that a long, two-story building is not as well suited for the low elevation of the site, especially as viewed from the thruway. The placing of the building on the long axis of the site raised difficulties with a western exposure and required the introduction of sun shades and vertical fins as sun-control features."

The competition, which had the approval of the competition committee of The American Institute of Architects, was conducted for Governor Sherman Adams and his Executive Council by a committee headed by Maj. Gen. Frank D. Merrill, state highway commissioner.

PRUDENTIAL PLANS 18-STORY OFFICE BUILDING IN HOUSTON

AN 18-STORY granite and limestone structure designed by Architect Kenneth Franzheim of Houston will provide the Prudential Life Insurance Co. of America with its new Southwestern Home Office.

Construction is expected to begin late this fall and occupancy is expected for fall of 1951.

As much natural light as possible has been one of the aims of the architect; but he has also provided for sun control with heat-resisting and glare-eliminating glass for windows on north and east and aluminum exterior vertical solar fins and horizontal louvers on the south and west. Continuous strip fluorescent fixtures will assure 30-ft-c lighting at all desk tops.

Year-round air conditioning is planned, and a zone system has been designed to arrange for more cooling air to be received by portions of the building in the direct path of the sun than by other areas. Temperature and humidity will be equally controlled throughout all areas during all seasons.

The chosen site is a 30-acre wooded tract four miles from the Houston business district. Overall plans call for outdoor recreational facilities including tennis courts and softball field. A fountain of generous scale will be constructed in the center of a forecourt plaza, and the grounds will be landscaped to transform the site into a well-kept private park.

The main entrance loggia will have plexiglass skydomes, and the loggia also will be heavily planted. The building has been planned to take advantage of the natural beauty of the site.

The building will have a self-service lunchroom for employees and an auditorium large enough to accommodate periodic regional conferences of Prudential representatives from throughout the Southwest.

Parking facilities are provided at the rear of the building.

Exteriors on all sides will be finished with granite, limestone and aluminum. The entrance foyer and rotunda will be finished in marble, granite and wood.

Above: Photo shows how Mutual Life Insurance Company's new building looked when the firm moved in this Spring. The 25-story structure occupies the Broadway blockfront between 55th and 56th streets, has 421,000 sq ft of office space. Shreve, Lamb and Harmon Associates, Architects

CONSTRUCTION IN MAY DIPS SLIGHTLY FROM APRIL HIGH

CONSTRUCTION AWARDS in May declined, but only slightly, from the all-time record high in April, F. W. Dodge Corp. figures show, and the total for the first five months of 1950 is 56 per cent above 1949's five-month figure.

May awards of $1,347,603,000 were off less than one per cent from the April total of $1,350,496,000 in the 37 states east of the Rockies. The May figure for 1950 was 53 per cent ahead of May 1949.

Residential awards of $674,604,000 in May failed by only $232,000 to equal April's figure and were 95 per cent ahead of May 1949, carrying the five-month 1950 total of residential awards to a whopping 110 per cent increase over the corresponding 1949 figure.

Non-residential awards in May were nine per cent under April, 27 per cent over May 1949; public works and utility contracts 16 per cent over April, 24 per cent over May 1949.

Above: Photo of rendering of new store for B. Altman & Co., New York department store, at White Plains. Kahn & Jacobs, were the Architects

RESPONSE: MODULAR COORDINATION AND VA HOSPITALS

**** R. E. Guard, President, Association of Federal Architects, Takes Issue with RECORD Editorial***

Association of Federal Architects
National Bureau of Standards
Washington 25, D. C.

ARCHITECTURAL RECORD:

In the May 1950 ARCHITECTURAL RECORD there appeared an article purporting to convey the attitude of the Veterans Administration concerning use of modular sized building materials in their hospital construction program. This article, signed by Mr. Harold D. Hauf, your editor-in-chief, does not present the true facts and the information was apparently accepted by your editor without fully investigating the situation or consulting the proper authorities in Veterans Administration. I cannot let these statements go unchallenged and desire to correct this erroneous impression.

For some time the Veterans Administration has been giving careful consideration to the use of modular sized materials for new hospitals being designed by their staff. To arbitrarily condemn a Government agency or anyone for not wholeheartedly adopting the use of modular sized materials under conditions that presently exist in this country contributes nothing to progress. Do you advocate restriction of competition and elimination of standard sized materials which many manufacturers are still making and which are more readily obtainable in many localities than modular sized materials? Fortunately the Veterans Administration, as well as many architects in private practice, are sufficiently broad to consider both sides of this matter. Contrary to statements contained in your magazine, the specifications for the Oklahoma City Veterans Hospital permit the use of modular sized brick as well as other materials. Their policy has been and will continue to be that of giving consideration to the use of local materials on Veterans Administration hospital projects, whether modular or non-modular sized.

Because of your erroneous information that the Veterans Administration is opposed to the use of modular sized materials, your magazine indicates that this is one of the best arguments for the returning of the design of Veterans Hospitals to private architectural firms. I have heard of many reasons for assigning the planning of Veterans Hospitals to private architects but this is the weakest one that has come to my attention.

First of all, the Veterans Administration is vitally concerned with the providing of hospital beds for the physically and mentally ill veteran at the earliest possible date. It has been thoroughly demonstrated that the advantages of the many years of experience and familiarity with medical requirements on the part of the architectural force of the Veterans Administration creates an advantage that lies with this force rather than with private architectural firms.

Very truly yours,

R. E. Guard, *President*

**** Mr. Guard is also chief, Architectural Division, Veterans Administration***

ARCHITECTS, HOSPITAL MEN MEET IN JOINT CONFERENCE

NEARLY 3000 PERSONS, architects and hospital administrators, assembled in Minneapolis for the two-day session of the Upper Midwest Hospital Conference and the accompanying Architects' Seminar sponsored by the Minneapolis and St. Paul chapters of the A. I. A.

There was also a very large display of hospital equipment and construction materials on the main floor of the Minneapolis Auditorium, where the conference was held.

Architects thus had the double advantage of meeting and exchanging ideas with people who run hospitals and of being able to see and inspect equipment on a far larger scale than if their seminar had been run independently.

A group of young Twin City architects designed and constructed the architects' exhibit, which attracted much interest and comment — including the rewarding reaction from some commercial exhibitors that next year their displays would be architect-designed.

The architects' exhibit featured drawings of small hospitals from the boards of Long and Thorshov, Inc.; Skidmore, Owings and Merrill; Lang and Raugland; Magney, Tusler and Setter; Ellerbe Co. and others, all very ably presented.

The program proved lively and provocative of much discussion. The talks of James Hamilton and Thomas F. Ellerbe turned into a somewhat heated exchange of very different views and had the architects talking about the danger of becoming mere construction advisers "if the hospital consultants had their way." Carl Erikson gave a talk in the afternoon which covered just about the whole field of hospital construction.

Robert Cunningham's dinner talk was lauded as "brilliant" — "tuned exactly to what we wanted to hear." Stimulating talks Friday morning were climaxed by Dr. Carl Walters' concise discussion of logic in planning the operating room.

Robert Cutler of Skidmore, Owings and Merrill spoke with authority on the workings and conclusion of a new operating room code; and Glen Rowell came by plane from the N.F.P.A. convention to give a timely and up-to-date talk on fire hazards. Wilbur Tusler pretty well summed up the whole conference with his talk on departmental relationships and schematic solutions.

Proceedings of the seminar, complete with questions and answers in the discussions, are available at five dollars per copy from Edward H. Noakes, executive secretary, Upper Midwest Hospital Conference, 400 Metropolitan Life Building, Minneapolis 1, Minn.

Art Photo Associates

$20 MILLION LOS ANGELES STATLER COMBINES HOTEL AND OFFICE UNITS

CONSTRUCTION gets under way this month on the $20,000,000 Statler Hotel and Office Building in downtown Los Angeles, the largest hotel built anywhere in the last 20 years.

Holabird & Root & Burgee of Chicago are architects for the project, with William Tabler of New York as associate architect.

The 13-story steel and concrete structure has been designed in four long, extended wings to give all the hotel's 1275 guest rooms outside exposures. The adjoining office building (at extreme left in photo of perspective above) will provide 150,000 sq ft of office space.

Features of the hotel include a 475-car underground garage with an escalator from the motorists' lobby to the main lobby, a swimming pool in a patio, television in every room.

A specially designed air conditioning system will serve all guest rooms and the office building. Centrifugal refrigerating machines used in the installation will have a capacity of more than 2100 tons.

Completion is expected in two years.

THE RECORD REPORTS

NEWS FROM WASHINGTON *by Ernest Mickel*

Housing Research Stepped Up as Both Government and Private Groups Announce Newest Plans; Architects and Home Builders Plan to Talk Things Over; BLS Finds Unit Construction Costs Moving Up; Reorganization Plan Would Transfer FNMA to HHFA

RESEARCH in the housing field continues on all fronts, private and government, with the HHFA division placing emphasis on efforts to lower the end cost of new housing. The Building Research Advisory Board went ahead with plans for its second correlation conference — this one to deal with fire-resistant exterior walls — and The American Institute of Architects had a mandate from its recent convention to find more funds for an expanded research program.

The A.I.A. resolution anticipates extension of the present Institute research activities under direction of Walter A. Taylor. It is believed that certain projects already authorized, but not yet activated, will be permitted to go ahead under the new plan. The first step is likely to be appointment of a committee by A.I.A. President Walker to discover new money sources for expanding the education and research duties.

Under consideration are: (1) an extensive review of technical documents; (2) a clinic service for defective materials; (3) a research advisory service closely correlated with the Building Research Advisory Board; (4) establishment of a new advisory committee; and (5) the building of a more complete system of files and records.

The advisory service probably will evolve as a direct service to industry, closely allied with the BRAB effort. Object is to aid those firms planning expenditures of their own in the research field, helping them to avoid overlap in projects and assist them in using their funds more wisely to select the place where investigation is to be made.

The Institute's clinical service on defective materials would be conducted on an anonymous basis, with confidential information going to architects dealing with specific manufacturers. Typical material cases may be developed later with results of the investigations published anonymously.

BRAB Conference Report

The Building Research Advisory Board has issued proceedings of its first correlation conference, January 11 and 12, on the subject of weather and the building industry. This Conference Report No. 1 is a 160-page booklet carrying in full the papers given. In a foreword, William H. Scheick, the Board's director, explained:

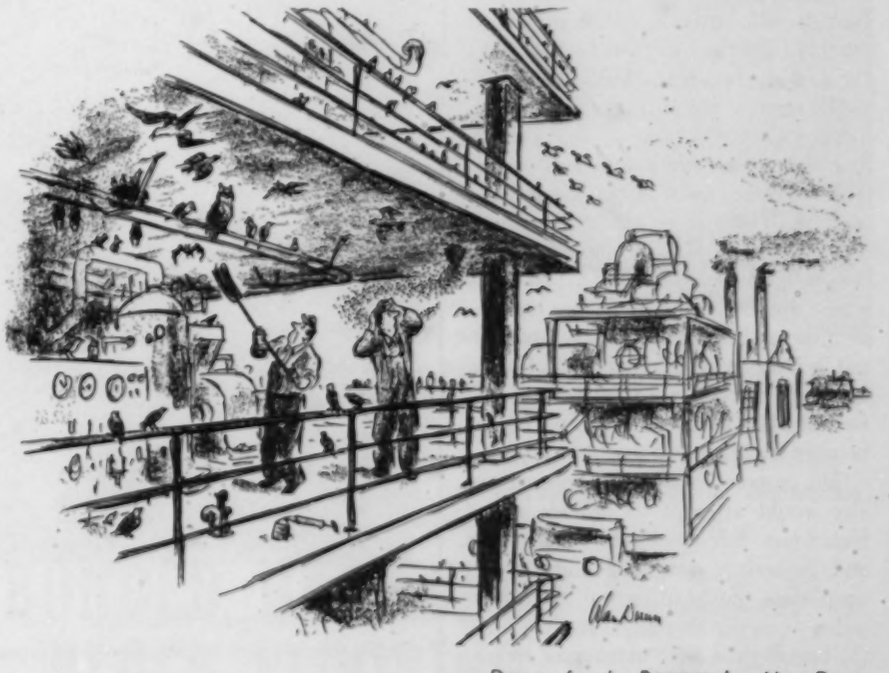
"These papers provide a remarkable summary of what is known on climatology today and the relationship of climatology to the building industry. In addition, they contain penetrating analyses of the present status of research in building materials and equipment by men who know the entire field."

Conference No. 2, on the general subject of fire resistance of exterior walls, will be held sometime during the summer or early fall. The subject for this research correlation meeting was suggested in letters to BRAB from Andrew J. Eken, president of Starrett Brothers and Eken, New York contractors, and John O. Merrill, of Skidmore, Owings and Merrill, Chicago architects. The Board believes this will be a conference of prime significance, Scheick said, because it concerns a specific problem of limited scope but broad interest; because it concerns major buildings; and because it is an active and vital problem, not merely a theoretical one.

The Structural Clay Products Institute moved closer to the practical phases of its five-year research program with announcement that Armour Research Foundation, Illinois Institute of Technology, Chicago, had been selected as the technical research center of its Products Research Foundation. The initial phase of the Institute's $1,250,000 long-range research effort will be started there. Primarily the work at Armour will center on end-use research in brick and tile and other structural clay products. Lower-in-the-wall masonry costs will be the main objective. The studies will include effects of unit size, weight, assembly techniques, etc., on the cost of wall construction.

Robert B. Taylor, S.C.P.I. research director, said new clay products (on a non-wall type) also will be evaluated to determine practicability and marketability. It all looks toward additional sales potential for clay. There will be no delay in getting the program started at Armour.

(*Continued on page 16*)



—Drawn for the RECORD by Alan Dunn

WASHINGTON

(*Continued from page 15*)

Other locations for studies of efflorescence, insulation and condensation, and fundamental clay research will be decided upon and announced shortly, Taylor said. He will establish an office in Chicago to direct the work first-hand.

The Clay Products Institute inaugurated a new service in April, beginning publication of "Technical Notes," which it calls a monthly informational service to the construction industry in the interests of better masonry structures. The early issues dealt with construction of watertight masonry walls, cold weather masonry construction, efflorescence, and painting brick and tile walls. Each of the publications carries an A.I.A. file number.

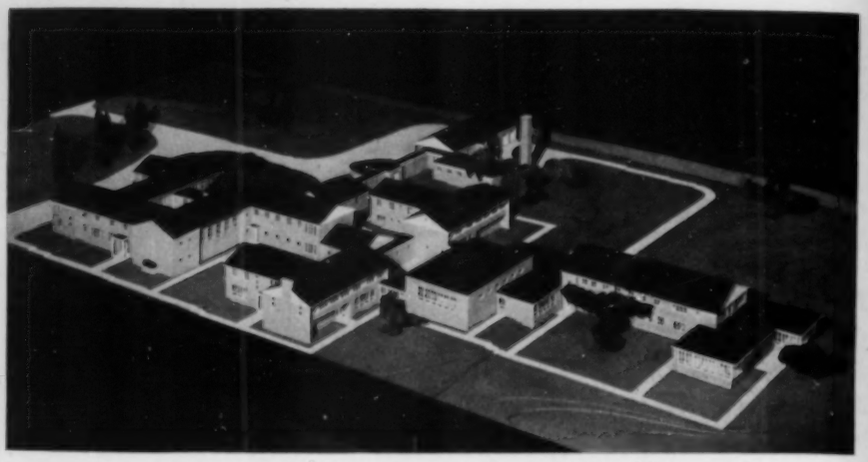
Latest on HHFA Research

As of mid-May, the housing agency had negotiated or was in process of negotiating more than 50 research project contracts. This involved the eventual outlay of nearly $1 million in the expanding program authorized in the Housing Act of 1949.

Announcements had been prepared on three imminent projects involving more frequent census studies of housing inventory and metropolitan area growth patterns and a pilot study of one industrial area. Under the first, the Census Bureau will attempt to work out a reliable statistical method for sounding the nation's housing inventory at intervals between the regular censuses, a method that will tabulate and classify available census data and supplement it as necessary by a scientific sampling method. There is recurring need, said Dr. Richard U. Ratcliff, director of the research division of HHFA, for data which would indicate important changes at intervals within the decade and permit a frequent check on production of adequate housing. He thinks this would be valuable to every segment of the housing industry and to public groups.

The proposed intercensus housing survey would attempt to provide tested techniques for classifying census data and gathering, compiling and keeping up-to-date information on (1) occupancy — owner or renter; (2) vacancy; (3) rental value; (4) number of rooms;

(*Continued on page 18*)



Sacred Heart Orphanage, operated by the Sisters of St. Joseph in Scarborough, Ont., will soon have a $600,000 new home (photo of model above). The proposed buildings, planned for a 17-acre site, will be of modern, fire-resisting construction. There will be three separate cottages for children, classrooms for nursery school and kindergarten-primary purposes, a convent for 10 sisters, a chapel, a gymnasium, an infirmary, a central kitchen, dining rooms and kitchenettes in each cottage. Page & Steele, Architects

NEWS FROM CANADA *by John Caulfield Smith*

Building Up $36 Million For Four Months of 1950

CONSTRUCTION awards for the first four months of 1950 registered a gain of $36 million over the corresponding period last year. April reached a new seasonal high with a total of $112,886,400. Figures come from MacLean Building Reports Ltd.

Plans for new construction include yet another refinery for Edmonton (this time, it's a $10 million job); a million dollar chemical plant to be erected in Sarnia, Ont.; and three new housing

(*Continued on page 176*)

George Lilley photography

Hospital for Religious Hospitallers of St. Joseph, Cornwall, Ont. Photo of rendering (above) shows only central portion of project, which includes 250-bed hospital, nurses' residence, monastery and boiler plant. Architects are Drever & Smith, Kingston, Ont.

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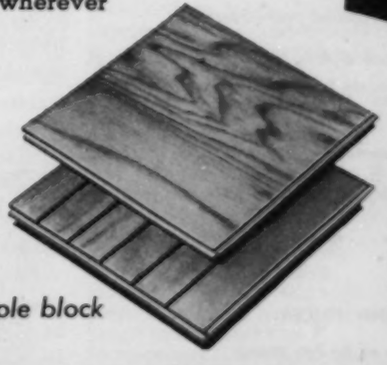

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THE RECORD REPORTS

WASHINGTON

(*Continued from page 16*)

(5) composition and size of households; (6) quality of dwellings as to physical condition and selected facilities.

Area growth studies would be undertaken by the Scripps Foundation, Miami University, Oxford, Ohio, in another research project aimed at supplying information to aid sound city planning and construction of residential areas properly related to centers of employment, lines of transportation and commercial and recreational facilities ($60,000 has been budgeted for this purpose).

Population Pattern Studies

The Scripps Foundation studies will use census and other data in examining every metropolitan area in the country. Results are expected to bring to light specific information hitherto unknown. Dr. Ratcliff said there is a notable lack of knowledge on patterns of population growth and economic development in urban and metropolitan areas. The Foundation study is expected to yield past and present trends to aid in charting future changes likely to affect residential construction and development, mortgage risks and other factors important to the housing industry and to the housing situation generally. The Foundation will develop (1) an explanation of the patterns of growth and of economic change in metropolitan areas and (2) conclusions concerning the nature of the change of population composition and the change in economic functioning which accompanies metropolitan growth. Objective is to obtain clear, definitive statements of facts for metropolitan areas as a class and by sub-classes, for practical public and commercial use. This study will consider population classifications by age, sex, nativity, education, employment status, major occupational group, major industrial group, wage and salary income, marital status and family status.

Finally, the third major project, the pilot study of housing market condition in a middle-sized industrial area, will be conducted by Miami University, Miami, Fla., in Jacksonville, Fla. Methods developed in the Jacksonville study will be applied to similar industrial, middle-sized communities later.

(*Continued on page 20*)

HOW to shorten the trip from here to here

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From plan to finished structure, the trip is shorter—smoother—when you use the Masonite* Hardboard family! These hard, smooth, grainless wood panels—available in 19 types and thicknesses—speed construction all along the line—reduce building costs—assure quality and owner satisfaction. For example—

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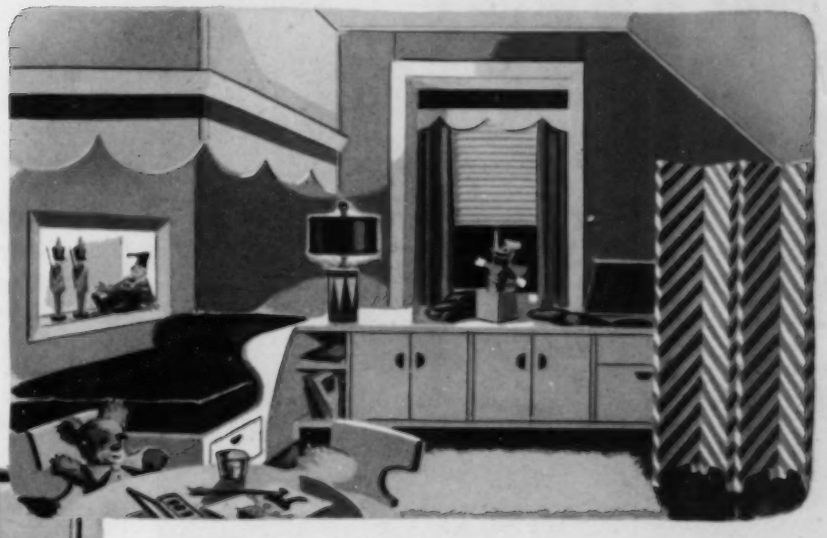

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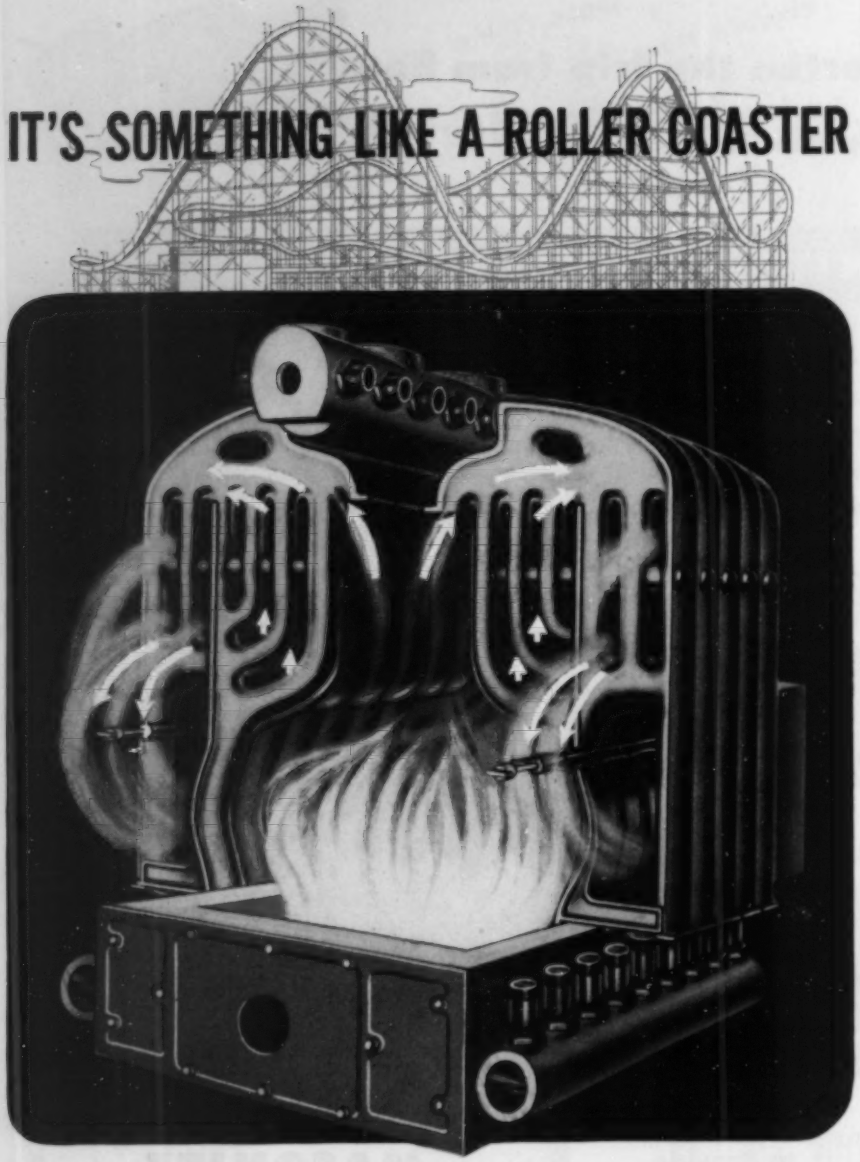

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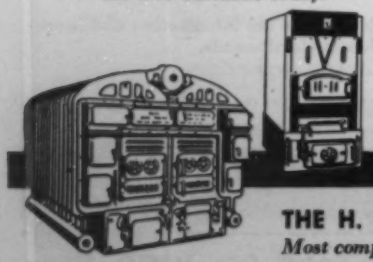

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WASHINGTON

(*Continued from page 18*)

Dr. Ratcliff explained that development of a short-term forecasting method will permit those concerned with housing in a given locality to obtain reliable background data on which to base business decisions. Groups to benefit especially, he believes, include civic and trade organizations, builders, mortgage lenders, material suppliers, real estate firms and planning agencies.

The Jacksonville study will undertake to (1) identify types and sources of available information; (2) develop a simple method of interpreting the material; and (3) suggest ways of organizing a small local group to carry out similar collection, organization and analysis of data.

Other HHFA Projects

Also in the works for HHFA were the following research projects:

Performance standards for building sewer materials, National Bureau of Standards.

Motion of floors laid on grade, Southwest Research.

Study of residential mobility and study of housing market analysis, Columbia University.

Financing construction of housing in selected mid-western cities, Indiana University.

Development of cost accounting systems for home builders, University of Michigan.

Nine separate projects dealing with wood uses, Forest Products Laboratory, Madison, Wis.

Structure and problems of home building industry, University of California.

Cost of municipal services for residential areas, Harvard University.

Rental housing investment experience in New York metropolitan area, Columbia University.

Examination of qualitative aspects of local housing market in locational terms, Georgia Tech.

Survey of mortgage market of Hagerstown, Md., University of Maryland.

Mortgage market survey of San Fransisco Bay area, University of California.

Four separate projects for Bureau of Labor Statistics dealing with measurements of volume of conversions and demolitions, size of builder operations.

(*Continued on page 22*)

Exterior View of Corn Products Refining Co. Laboratories, Argo, Ill.
Schmidt, Gardner & Erickson, Architects.

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Literature will be mailed on request.

WASHINGTON (*Cont. from p. 20*)

historical data and a survey of cooperative housing associations.

Light gage tubular columns, National Bureau of Standards.

Financing construction of housing selected in cities of the Northwest, University of Washington.

Guide for cooperative self-help dwelling construction, Tuskegee Institute.

Study of residential space utilization, University of Illinois.

Planning survey of interracial housing, New York University.

Cost advantages of different types of industrialized housebuilding organizations, Massachusetts Institute of Technology.

Survey of potential redevelopment area, American University.

Background study of marketing functions in building products distribution, University of Pennsylvania.

Development of techniques for measuring and interpreting vacancy rates in a community, University of Denver.

The projects listed above are in addition to 20 on which negotiations have been completed. They had been assigned project numbers and allocated funds.

Architect-Builder Cooperation

It may take a year, but organized architects and organized home builders are moving toward an area of closer agreement on the role of the former in the production of individual homes in large subdivisions.

This summer, perhaps this month, committees from the National Association of Home Builders and The American Institute of Architects will sit down together to study ways of making mass-produced low-cost houses more individual architecturally. They are determined to erase the "no-man's land" now existing between operative builders and the architects when it comes to contemporary home design in that field.

Such a meeting had been scheduled earlier, when the N.A.H.B. executive officers convened in Washington; but A.I.A. spokesmen said notice was given too late to set up the proper kind of committee.

Ralph Walker, president of the Institute, considers this to be a most important effort and is at work on selection of a committee of six top A.I.A. men conversant with the needs who will meet with a like committee of N.A.H.B. members.

The builders, who have been severely criticized for their failure to market housing with more individuality, realize the need for improving their position in this respect. That is why they will ask the A.I.A. to agree on a system of national architectural fee scales. The question of fees is the foremost matter in keeping the architect from operating in this housing field, it is believed, and an understanding on compensation should go far toward bringing more architects to small home practice.

The architects themselves realize the gap existing between them and the operative builders, and desire just as ardently to do something about it. Edmund R. Purves, executive director of the Institute, explained Mr. Walker's position in considering it a vital problem commanding immediate attention. The start can be made now, but it may take a year to work out a satisfactory plan. An entirely new mode of operation may be sought.

(*Continued on page 24*)

HOW TO KEEP A BUILDING *on time*

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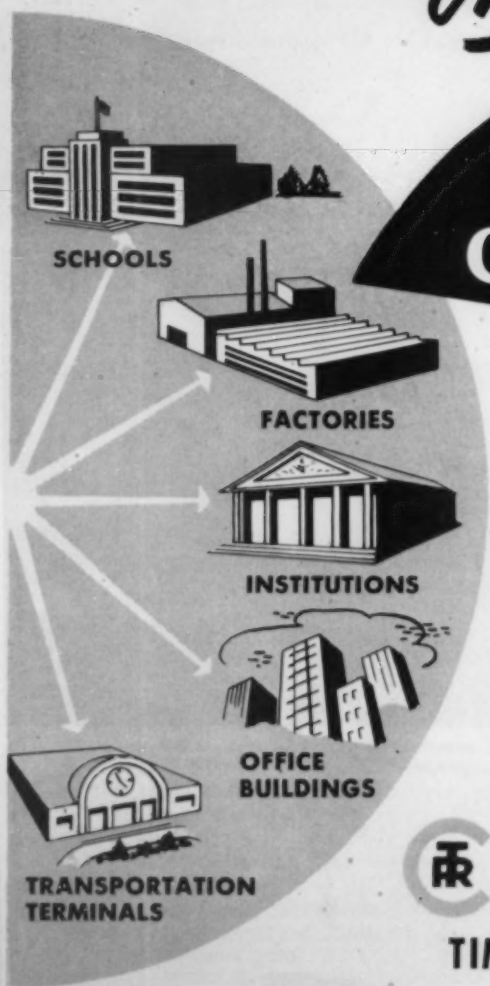

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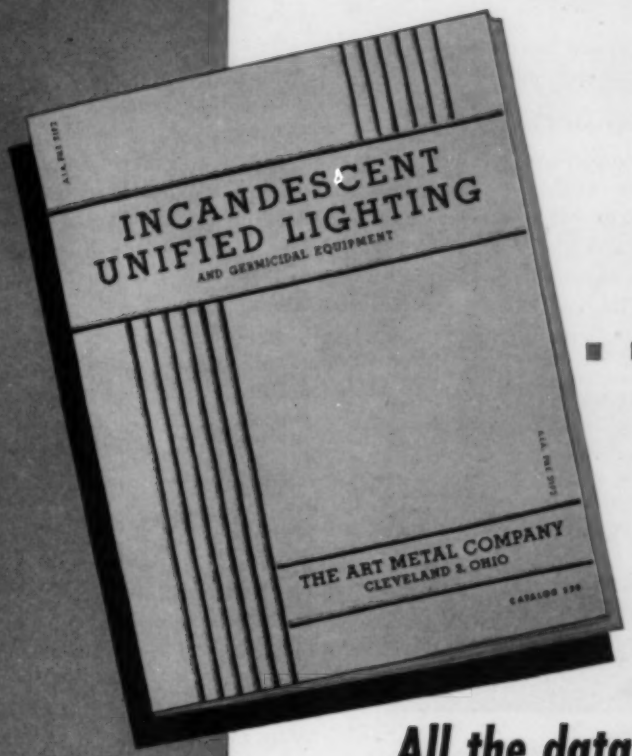

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"It is a very important and serious question," Purves stated. "It is a field in which very few architects have had experience. The design of a small house is not an easy problem. It is a very difficult one."

The committeemen will have to find some way of putting architectural talent to work in the low-cost housing field without letting the resulting increase in cost, due to the necessary architectural fee, overprice the house. It is a very difficult problem indeed.

FHA Reports on Costs

The annual report of the Housing and Home Finance Agency carries an interesting table on FHA property valuations indicating the average valuation of new homes secured by insured mortgages during the last half of 1949 was $8507; the median valuation, $8124. This pertains to new single-family homes with mortgages insured under Sec. 203 of the National Housing Act.

The figures for existing homes covered by the same provisions over the same period were slightly higher for the nation as a whole: average valuation, $9164; median valuation, $8721.

A geographical breakdown of this data, by Census Bureau regions, indicates the highest valuations were recorded in the New England and Middle Atlantic States for the new homes and in the New England and east north-central states for existing residences. Lowest FHA valuations on new homes were shown in the east south-central region, and on existing homes in the west south-central area, based on the averages.

For the nation as a whole, largest percentage of insured mortgage business written from July to December 1949 was on new homes in the $6000 to $6999 valuation class, 21.8 per cent. Next highest volume was 20.9 per cent on $8000 to $8999 valuation. Only two tenths of one per cent of the new homes so insured were valued at less than $5000 and one per cent was valued at $16,000 or more.

BLS Finds Rising Costs

The average unit construction cost for one-family structures rose slightly in February, compared with January, in 15 major metropolitan areas surveyed by the Bureau of Labor Statistics. Average unit building costs for each of the 15 cities as listed by BLS for February averaged $8933. The January figure was $8080. The February single-family home building costs were shown to be up from January in Atlanta, Chicago, Cleveland, Dallas, Denver, Detroit, San Francisco-Oakland, Seattle, and Washington, D. C. The February figure was down from January in Boston, Los Angeles, Philadelphia and Pittsburgh. It remained the same for Miami.

Costs dropped $400 per unit in the New York-Northeastern New Jersey area, according to the BLS table, going from $10,100 in January to $9700 in February. These tabulations show new dwelling units actually started during the periods and include both privately and publicly owned housing. Field surveys, currently being conducted by BLS in these selected areas, eventually will show, in addition to the estimated construction costs, details on

(*Continued on page 152*)

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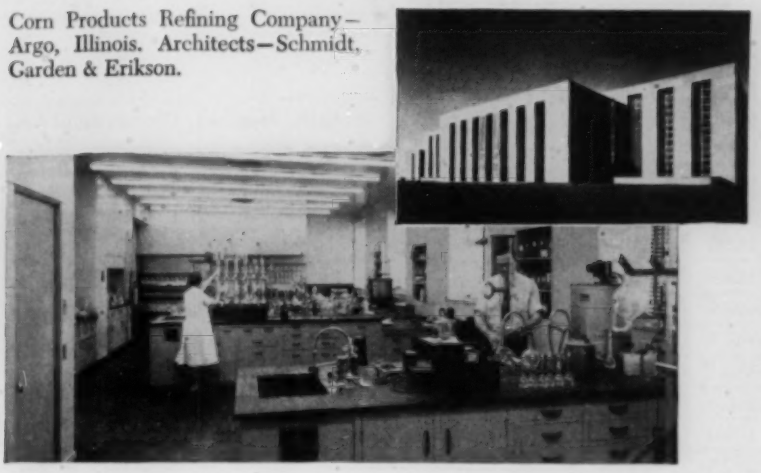
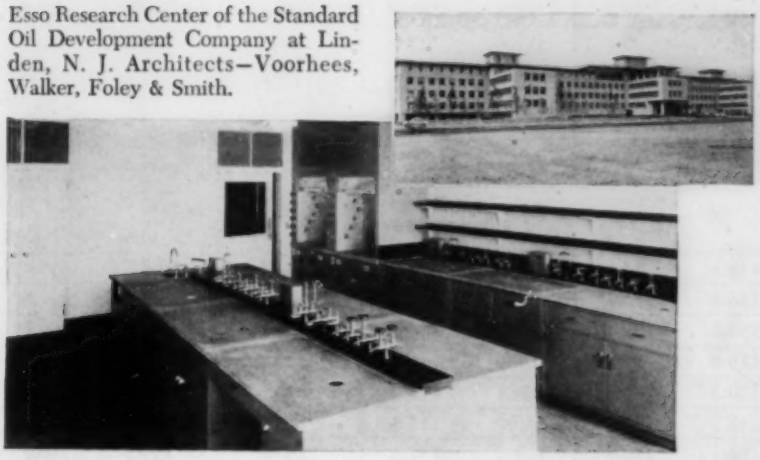
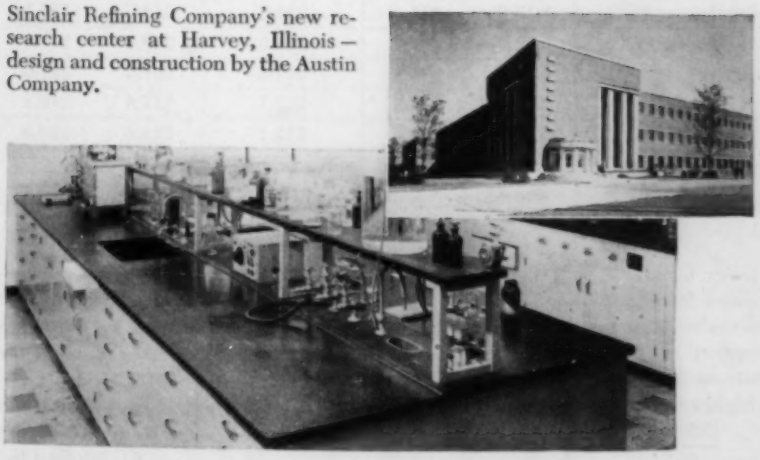


Esso Research Center of the Standard Oil Development Company at Linden, N. J. Architects—Voorhees, Walker, Foley & Smith.



Sinclair Refining Company's new research center at Harvey, Illinois—design and construction by the Austin Company.



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Schmidt, Garden & Erikson
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CONSTRUCTION COST INDEXES

Labor and Materials

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Presented by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assocs., Inc.

NEW YORK

Period	Residential		Apts., Hotels Office Bldgs.	Commercial and Factory Bldgs.	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1925	121.5	122.8	111.4	113.3	110.3
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1940	126.3	125.1	132.2	135.1	131.4
1945	160.5	161.7	156.3	158.0	155.4
1946	181.8	182.4	177.2	179.0	174.8
1947	219.3	222.0	207.6	207.5	203.8
1948	250.1	251.6	239.4	242.2	235.6
1949	243.7	240.8	242.8	246.4	240.0
Feb. 1950	244.1	240.9	243.2	245.9	242.0
Mar. 1950	244.9	242.0	243.4	246.0	242.2
April 1950	246.2	243.6	243.6	246.1	242.5
	% increase over 1939				
April 1950	**99.4**	**99.0**	**86.4**	**84.5**	**86.4**

ATLANTA

Period	Residential		Apts., Hotels Office Bldgs.	Commercial and Factory Bldgs.	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1925	86.4	85.0	88.6	92.5	83.4
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1940	91.0	89.0	96.9	98.5	97.5
1945	132.1	133.9	123.2	122.8	123.3
1946	148.1	149.2	136.8	136.4	135.1
1947	180.4	184.0	158.1	157.1	158.0
1948	199.2	202.5	178.8	178.8	178.8
1949	189.3	189.9	180.6	180.8	177.5
Feb. 1950	185.8	187.0	180.1	179.3	178.5
Mar. 1950	186.9	188.4	180.3	179.4	178.8
April 1950	187.9	189.7	180.5	179.5	179.0
	% increase over 1939				
April 1950	**117.7**	**128.3**	**89.8**	**84.3**	**89.0**

ST. LOUIS

1925	118.6	118.4	116.3	118.1	114.4
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1940	112.6	110.1	119.3	120.3	119.4
1945	152.8	152.3	146.2	148.5	145.6
1946	167.1	167.4	159.1	161.1	158.1
1947	202.4	203.8	183.9	184.2	184.0
1948	227.9	231.2	207.7	210.0	208.1
1949	221.4	220.7	212.8	215.7	213.6
Feb. 1950	222.7	221.3	215.6	219.0	217.4
Mar. 1950	222.8	221.2	215.8	219.1	217.6
April 1950	223.1	221.6	215.9	219.1	217.7
	% increase over 1939				
April 1950	**102.5**	**107.1**	**81.9**	**82.9**	**82.9**

SAN FRANCISCO

1925	91.0	86.5	99.5	102.1	98.0
1930	90.8	86.8	100.4	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1940	106.4	101.2	116.3	120.1	115.5
1945	146.2	144.3	144.5	146.8	147.9
1946	159.7	157.5	157.9	159.3	160.0
1947	193.1	191.6	183.7	186.8	186.9
1948	218.9	216.6	208.3	214.7	211.1
1949	213.0	207.1	214.0	219.8	216.1
Feb. 1950	215.3	209.2	217.8	221.4	217.9
Mar. 1950	216.7	211.0	218.1	221.6	218.3
April 1950	216.7	211.0	218.1	221.6	218.3
	% increase over 1939				
April 1950	**105.2**	**112.5**	**85.8**	**81.8**	**87.4**

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95
(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926–29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear whenever changes are significant.

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Honeywell's national advertising in House Beautiful, House & Garden, Newsweek and Time is urging home builders to consult you about the proper controls and control areas. If you would like additional information, contact the Honeywell office in or nearest your city, or mail the coupon for free booklet on "zone control," A.I.A. File No. 30E.

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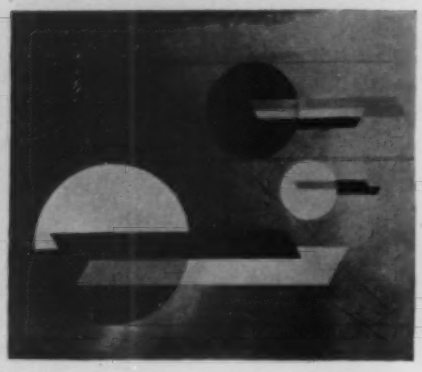


The formal and the spatial are supplemented by the dynamic in Moholy-Nagy's third phase: "Large Aluminum Picture," 1926

MOHOLY-NAGY — TOTALITY

Moholy-Nagy. Experiment in Totality. By Sibyl Moholy-Nagy. With an introduction by Walter Gropius, Harper & Brothers (49 East 33rd St., New York 16, N. Y.) 1950. 6½ by 9½ in. ix + 253 pp. illus. $6.50.

The drive and force of the late Hungarian Constructivist Moholy-Nagy, the influence of his creative intelligence upon contemporary design, his way of life — have been crystallized in this sensitive biography by Sibyl Moholy-Nagy, wife and co-worker.

The name "Moholy-Nagy" has won recognition and respect in almost every field of creative expression. Some of us are more aware of his genius in his capacity as a painter than as an industrial designer — or photographer — or typographer — or sculptor — or stage designer — or architect. Sibyl Moholy-Nagy presents him in the total complex combination, but emphasizes his role as a teacher. His teaching work, threatened by Fascism, was transferred from Berlin's Bauhaus to Chicago's short-lived "New Bauhaus," and then, constantly intensifying, led to the founding and success of the School of Design. She frankly and touchingly retraces the bumpy road of an assiduous teacher, unrelenting worker.

To point up the personal suffering and the professional difficulties of pioneering work, Mrs. Moholy-Nagy includes excerpts from letters and recountals of his conversations and opinions. This documentary information shows his fight against the choking effect of Beaux Arts dogma, and reveals his transcendence of the inadequacies of Cubism, Expressionism, Purism, etc. These examples make it clear that intellectual concepts of structure and form guided but did not limit his abilities to integrate and create. Rather, he grasped structure and form in terms of intrinsic values, and as entities to be understood in *form relationships*. He gave a healthy shot-in-the-arm to modern esthetics, for he created in terms of the *relationships* of values — with each other, and with the universal verities of space, light, and motion. He was an objective creator in the non-objective realm.

Just as he was devoted not to one medium alone, but used them all, so he was influenced not by esthetic theory alone. His wife seems to feel that it was his curiosity about all things physical and his acute awareness in many fields of study and research that enabled him to experiment and to correlate.

Mrs. Moholy-Nagy has recorded with competence and verve the story of a significant thinker.

FOR INSTRUCTION

Architectural Drawing. Perspective, Light and Shadow, Rendering. By Sherley W. Morgan. Illustrations executed by William Feay Shellman, jr. McGraw-Hill Book Co., Inc. (330 West 42 St., New York, N. Y.) 1950. 9⅜ by 12¼ in. 227 pp. illus. $7.50.

Architect Morgan's work concerns perspective and instruction in its relation to architectural drawing. Developed here are the theory of linear perspective and the determination of light, shade and shadow on objects to be depicted in elevation and plan.

Mr. Morgan proceeds from the particular to the whole. The "phenomena of perspective," rather than being treated by a single method with specialized applications for each varying problem, are broken down to several principles of universal application.

Fundamental problems are given, their solutions carried out, step by step. Problems and questions for the student accompany each chapter.

Following basic principles, methods, and instruction, are chapters on aerial perspective, the rendering of orthographic drawings, special problems in shadows, symbols and definitions, and a selected bibliography and index.

Although the volume has been organized ostensibly for classroom use, it is presented in such an efficient manner as to permit quick and cogent reference for one concerned with architectural drawing problems. But, it has been cautioned, it is not a book to be jumped into at random. For its design is based on a consecutive procedure.

One half the book consists of architectural drawings; one half, of text. The drawings and text are so integrated that an absolute minimum of page turning is necessary.

The instruction content is clear and straightforward; the organization of the book as a whole, functional. Without a doubt, both prospective and practicing architects will consider Mr. Morgan's book a requisite for the reference shelf.

SUR LE PONT . . . .

The Architecture of Bridges. By Elizabeth Mock. The Museum of Modern Art (11 West 53rd St., New York, N. Y.) 1950. 8½ by 11½ in. 127 pp. illus. $5.00.

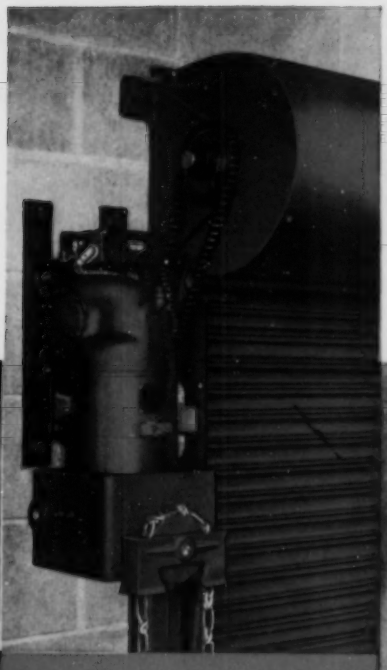
". . . a beautiful bridge has a life quite beyond its purely practical functions." This is the crux of Mrs. Mock's picture book, a history of bridges presented not only in terms of the four materials: stone, wood, metal, and reinforced concrete, but also in terms of response to these materials, through the lively and imaginative concepts of capable engineers and architects.

And so the art of bridge structure, including the three types of bridge construction, is traced in excellent photographs and by explanatory text, from the earliest bridges extant (or at least, within camera range before war destruction). Roman, English, Chinese, German, French, Swiss, Swedish, and American spans are cited, criticized. Such "at-first-glance" pleasing structures as the George Washington and Bronx Whitestone do not escape author Mock's candid scrutiny.

That studied mass in bridgework is *not* requisite in this day of reinforced concrete and steel, tersely is indicated by the author. Maillart's achievements in Switzerland, Sweden's clean spans, the vigorous and often light French designs are sufficient proof. Even so, the hesitancy to exploit our modern materi-

(Continued on page 30)

Rolling Steel DOORS



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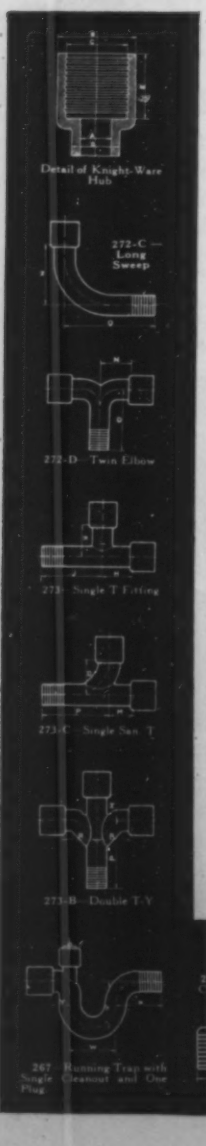

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* Only known exceptions: Hydrofluoric acid, hot caustics.

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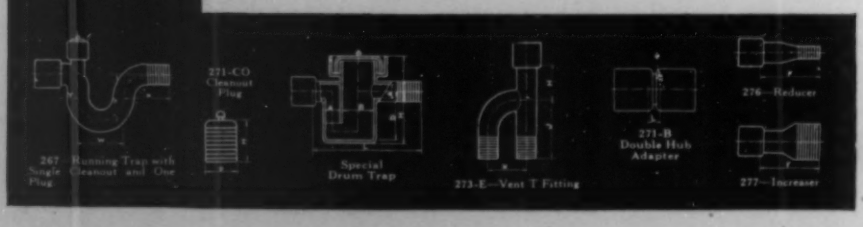


REQUIRED READING

(*Continued from page 28*)

als unfortunately is with us still, according to the author. The mistrust of modern material, based on the concept that only in *mass* is there stability and ultimate virtue, has not yet been dispelled.

This, another Museum of Modern Art publication, is as usual, of commendable format. Its photographic content is esthetically satisfying, bold and telling. Mrs. Mock has presented a view of the art of bridge architecture with felicity and integrity.

MASTER PLANNER RENEWED

Cities in Evolution. By Patrick Geddes. Ed. by the Outlook Tower Association, Edinburgh, and the Association for Planning and Regional Reconstruction, London. New, rev. ed. Oxford University Press (114 Fifth Ave., New York 11, N. Y.) 1950. 5⅞ by 8¾ in. xxxi + 241 pp. illus. $3.75.

Patrick Geddes wrote about his book in the preface to the first edition, 1915, it ". . . is neither a technical treatise for the town-planner or city councillor, nor a manual of civics for the sociologist or teacher, but is frankly of introductory character." "It is not solely an attempt at the popularisation of the reviving art of town planning, of the renewing science of civics . . . What it seeks is to express in various ways the essential harmony of all these interests and aims."

In the main part, the text of the new edition is the same as its predecessor. Outdated material has been omitted; the well-known "Geddes Exhibition," or cities exhibition, inserted. This is divided into six parts: the Valley Section, Origins of Planning, Mediaeval Cities, Renaissance Cities, Great Capitals, Garden Cities. New appendices correlate Mr. Geddes' social philosophy and familiar diagrams — where, for example, we find his "in-world," "out-world" distinctions.

In such chapters as "Paleotechnic and Neotechnic," "The Spirit of Cities," etc., Geddesian phraseology acquires renewed significance.

Mr. Geddes has interpreted "place" by people and their activities. He has synthesized, in his use of "survey," physical planning with sociology and economics. It is through such well-known tags as "conurbation," then, that he has made convincing his talking points. As he himself stated, the facts are not new. Yet his appeal, even 35 years later, remains valid.

TEATRO CULTURA ARTISTICA

São Paulo, Brazil

Rino Levi, Architect

Associate Architects

F. A. Restalozzi

Roberto Cerqueira Cesar

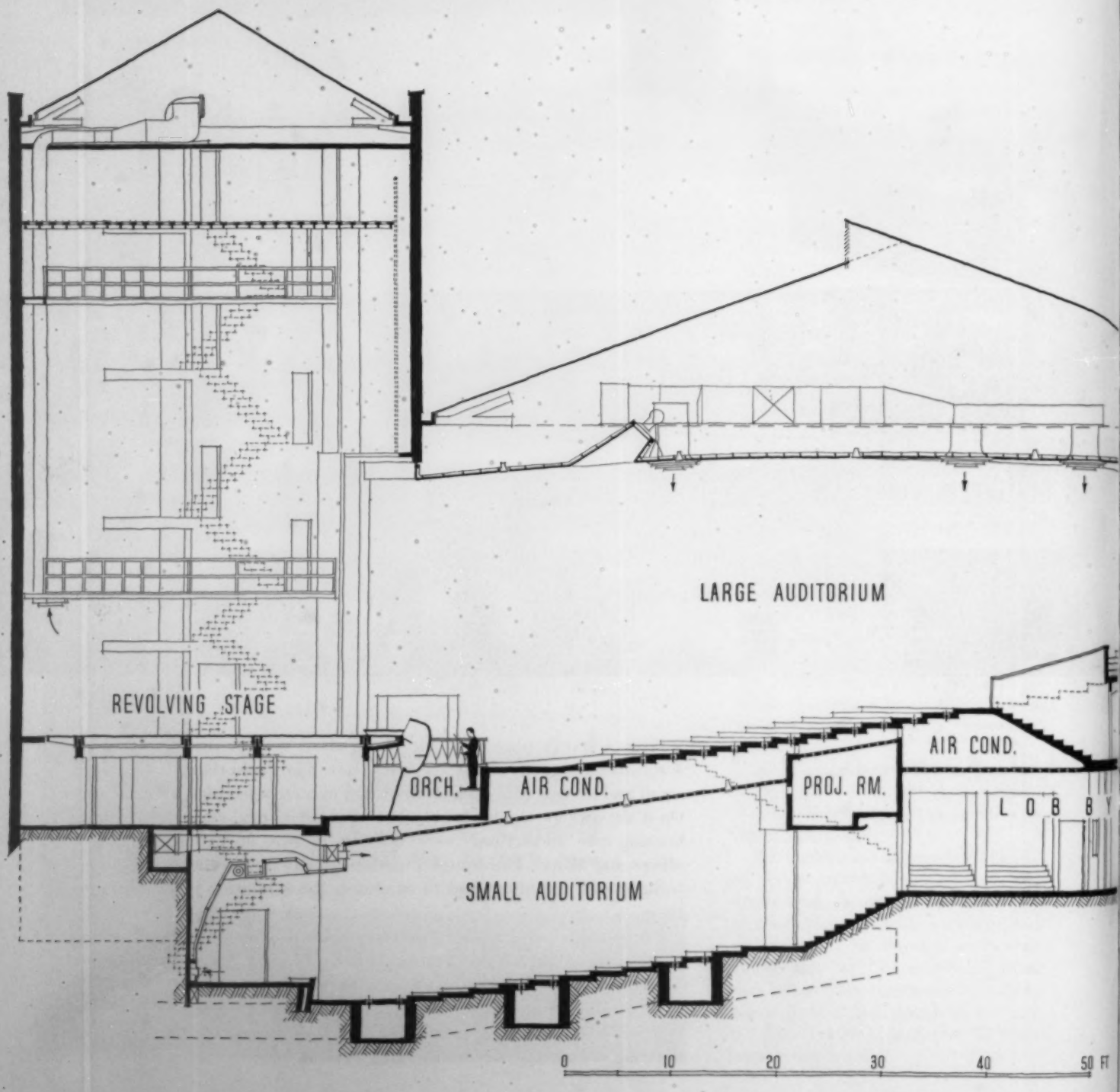
Sjoerd de Boer Photo

EVEN A HASTY GLANCE at the photo above reveals the main problem confronting the architects of this new São Paulo theater. The site is small and irregular in shape and located in a crowded section of the city. On it the owners, the Sociedade de Cultura Artistica, required a building housing two auditoriums very difficult in size, an exhibition gallery, offices and shops. The solution obviously was to superimpose one auditorium upon the other, and to sandwich the exhibition gallery between them.

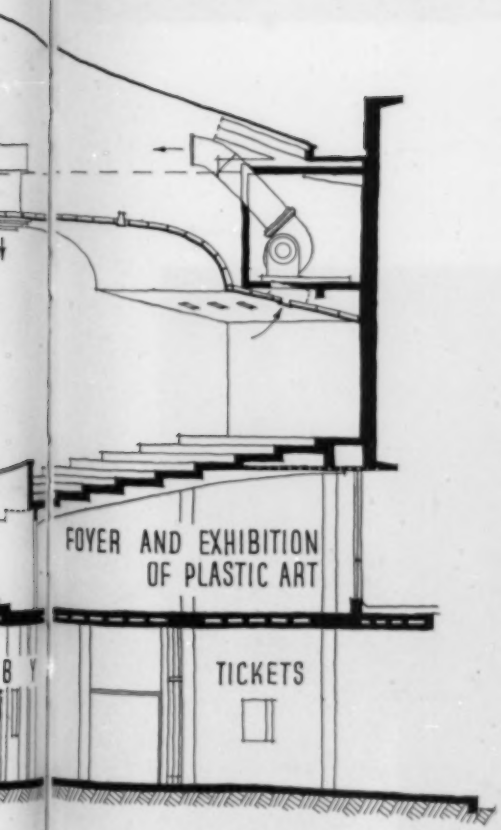
The smaller hall was placed partially beneath ground level (see section, next page) to permit one entrance lobby to serve the entire building. Audience circulation was controlled by providing separate exit stairs and corridors close to the side limits of the site, reserving the five front stairways for incoming patrons. Each auditorium has its own stage dressing rooms and air conditioning system.

Since the smaller auditorium is intended only for concerts and lectures, no provision for scenery shifting was necessary. The larger hall, however, not only has a fully equipped stage house for vertical shifting but also a revolving stage 34½ ft. in diameter. For special productions needing additional space, the floor of this stage can be enlarged temporarily to cover the orchestra pit; the footlights and the prompter's box, therefore, are movable. The stage curtain (see page 89) is circular and metallic, operates mechanically in case of fire.

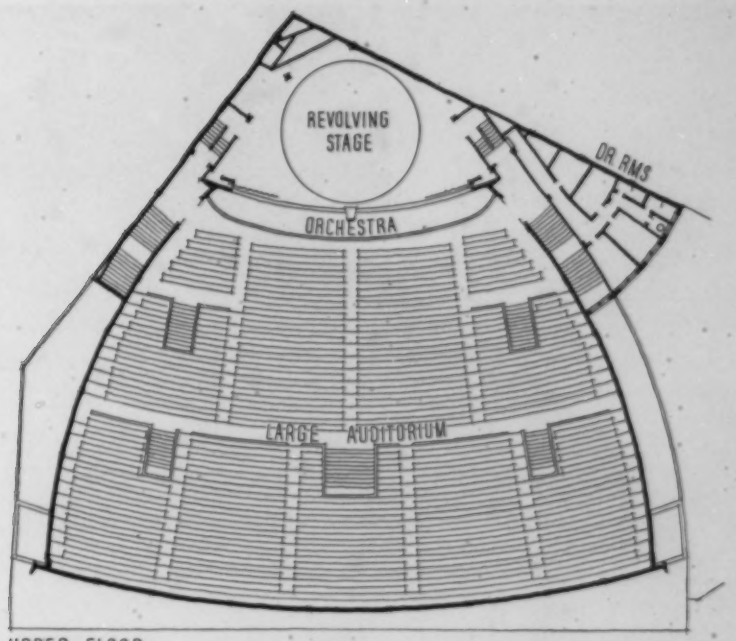
Acoustical control was achieved almost entirely by selecting shape and volume to get desired reverberation times. The volume was changed by test calculations until the proper ceiling height had been determined. Acoustical material was used only on the rear wall of the larger auditorium where it was considered essential to prevent a delayed return of sound to the section near the stage.



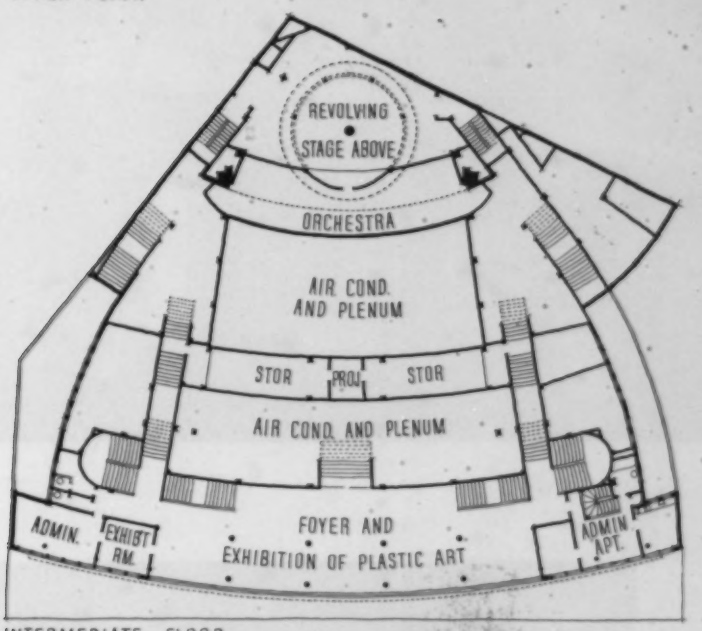
The two auditoriums are quite different in shape, but the seating plan of the smaller exactly matches the lower two center sections of the larger. Each hall has its own air conditioning system, planned for both winter and summer use; air is brought in at ceiling level through gratings and circular air diffusers and removed by under-seat exhausts



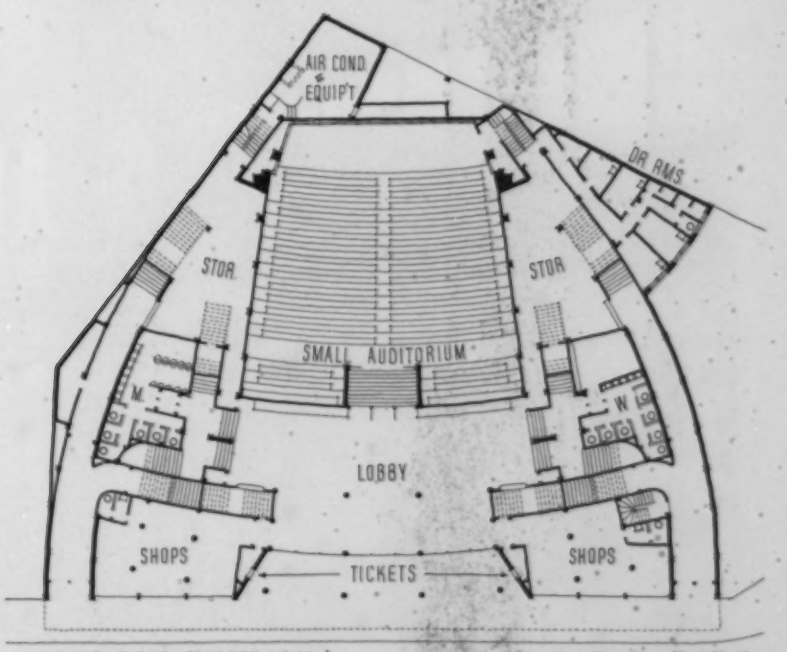
SECTION



UPPER FLOOR



INTERMEDIATE FLOOR



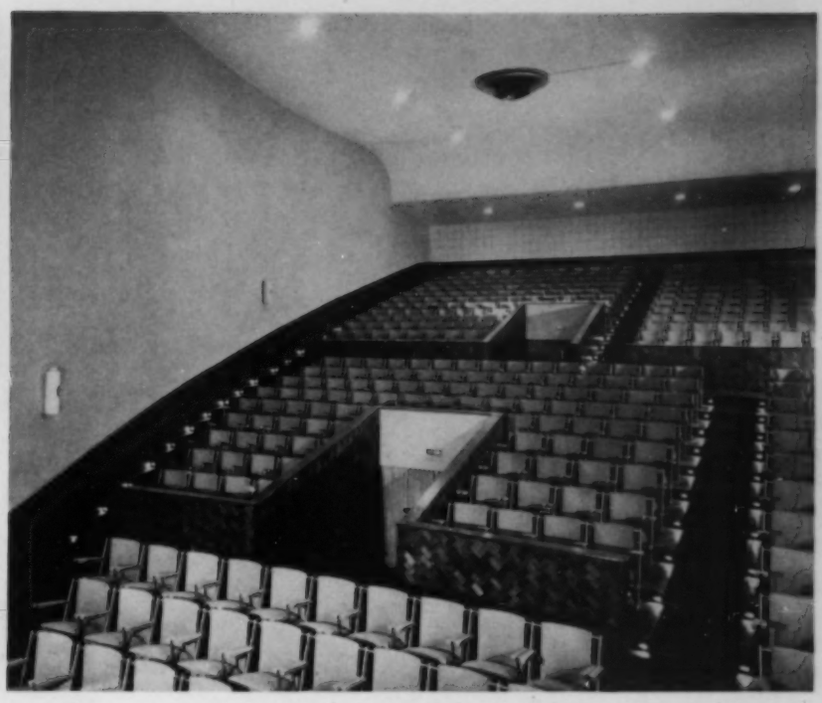
LOWER FLOOR (STREET LEVEL)

0 10 20 30 40 50 FT

Leon Liberman Photo

Sjoerd de Boer Photo

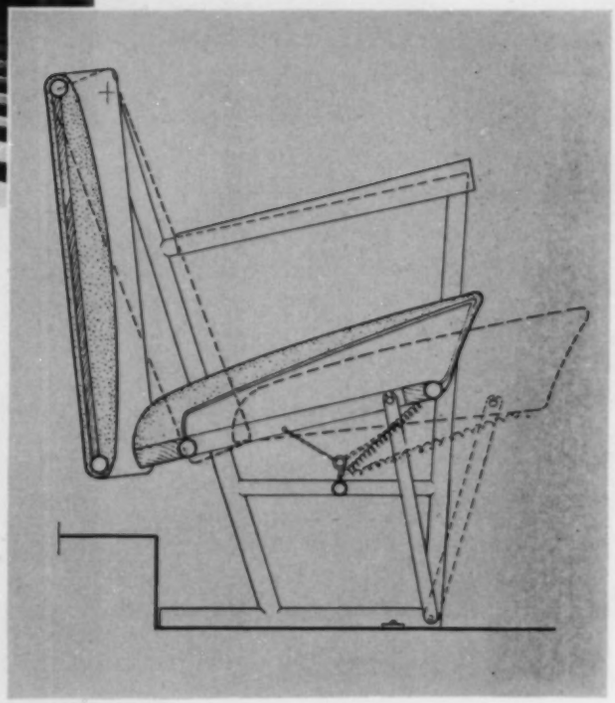
Sjoerd de Boer Photos



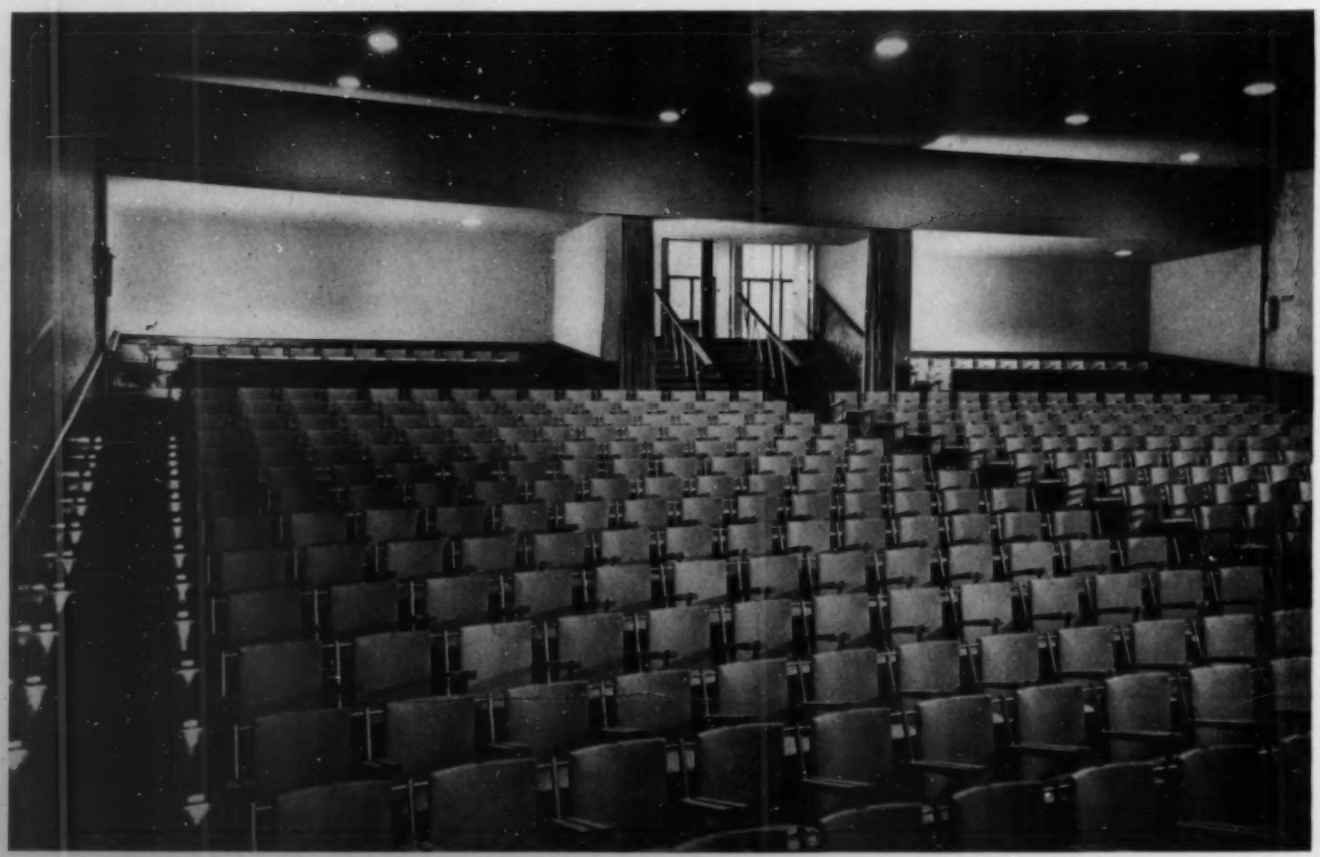
The limited site, the architects comment, permitted expression of the "importance and purpose" of the building only on the street facade. Here a huge glass mosaic (157½ ft long, by 26 ft high) lends dramatic interest to the entrance; designed by the painter E. Di Cavalcanti, it was executed in São Paulo. Beneath it is the curving glass wall enclosing the exhibition lobby on the intermediate floor (left). The large auditorium (two photos above) seats 1560, is used for both concerts and theatrical performances. Revolving stage (right) has wooden frame, several trap doors. Metallic curtain runs on semi-circular course, closes mechanically in event of fire. Exits close to stage are used between performances, lead directly to street. Width of stairways and entrance and exit corridors was worked out on ratio of about 40 ft per 100 people

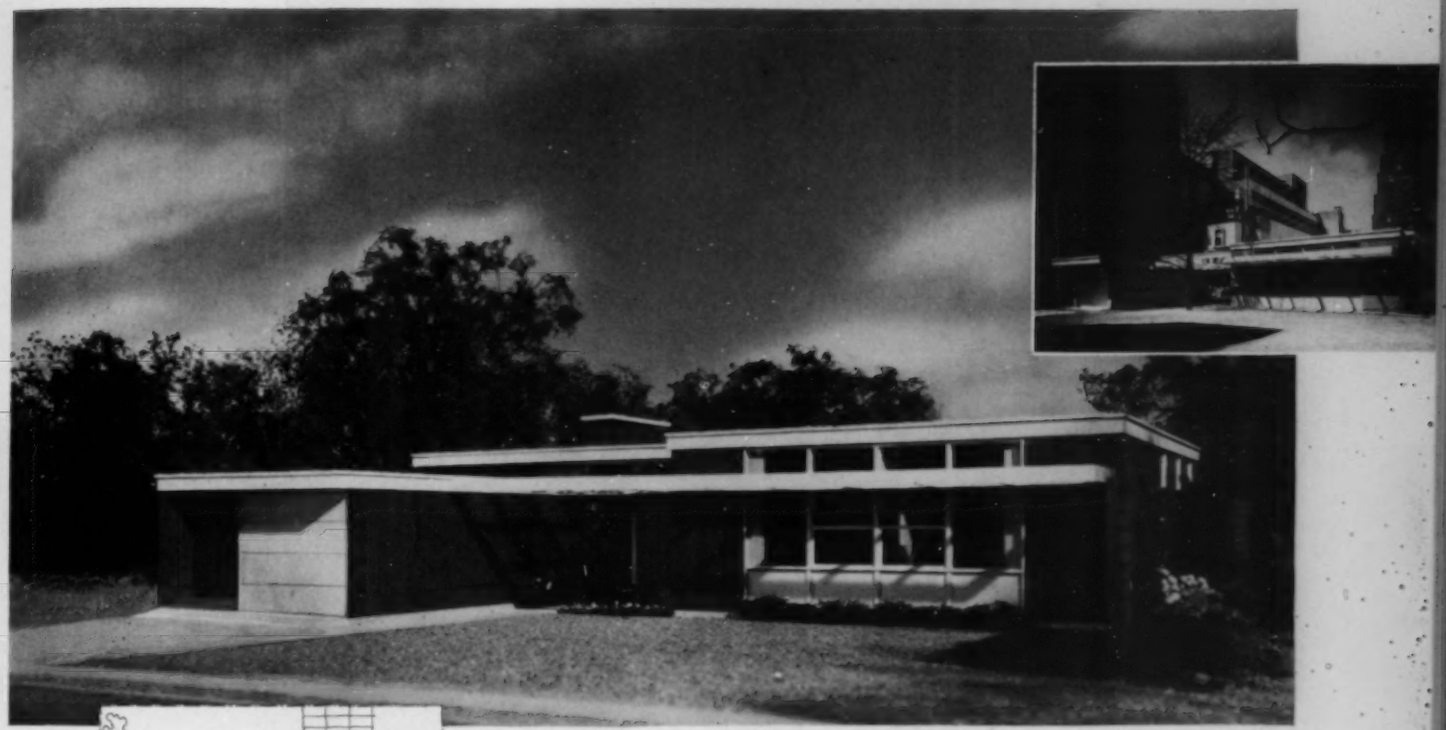
Curt Photo

Sjoerd de Boer Photos

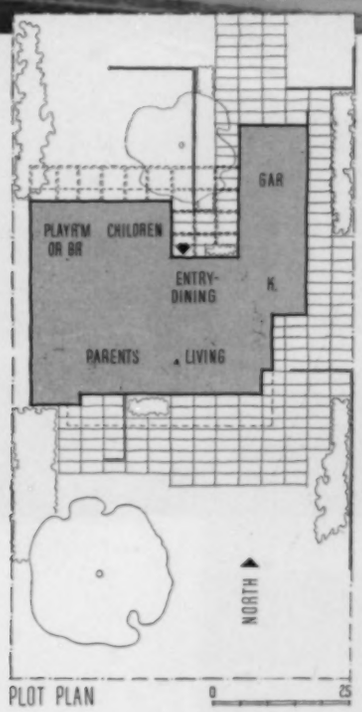


Small auditorium seats 458, is used for chamber music concerts, lectures, etc. Both halls use special seats (right) designed by the architects to permit more convenient passage between rows; the seat swings back out of the way when its occupant leans forward, eliminates necessity of jumping up and down





Large photo (of model), Louis Checkman; small, Ezra Stoller



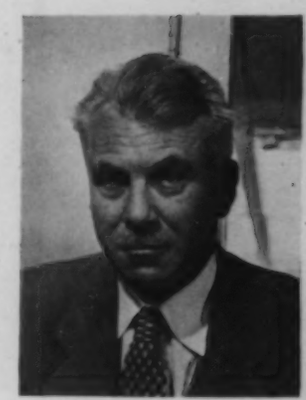
DESIGNED FOR SUBDIVISIONS

Museum of Modern Art — Woman's Home Companion Exhibition House

Gregory Ain, Architect

Joseph Johnson & Alfred Day, Collaborating

Homer Page Photo

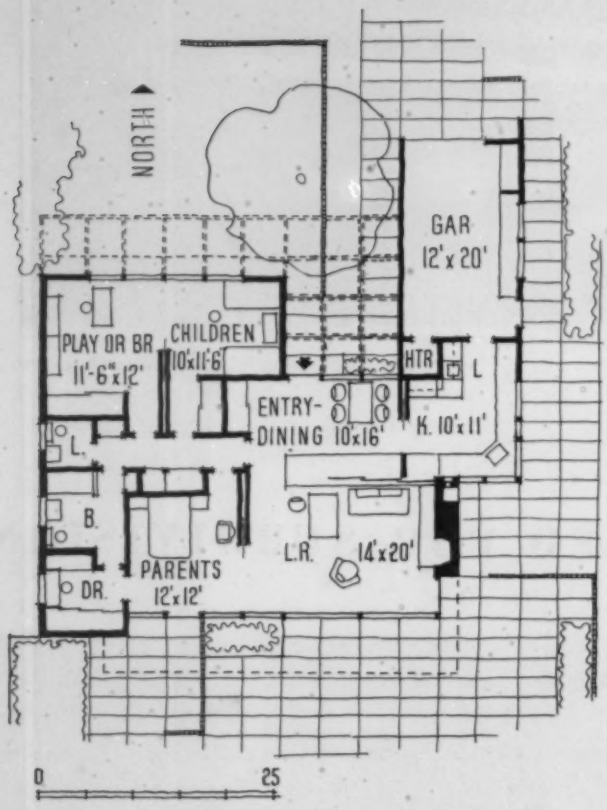


IN EVERY subdivision some lots don't sell well; perhaps they're small, or poorly oriented, or oddly shaped. In truth, such lots predominate; they are the "average" situation, and it is this problem which New York's Museum of Modern Art and the magazine *Woman's Home Companion* jointly put up to Gregory Ain (photo at right). They wished to demonstrate the suitability of contemporary architecture for such a site. Ain has had considerable experience, in the vicinity of Los Angeles, in working with speculative builders. Program requirements for this house included: lot 60 by 120 ft.; one floor, 3 bedrooms, 1½ baths; compact, flexible plan organized to suggest spaciousness, suitability for standardized subdivisions but without the usual monotony. The 1420-sq-ft house, which may be built in a number of cities, is expected to cost from $15,500 to $19,500.

EXHIBITION HOUSE

Louis Checkman Photo

Left, model; below, as built



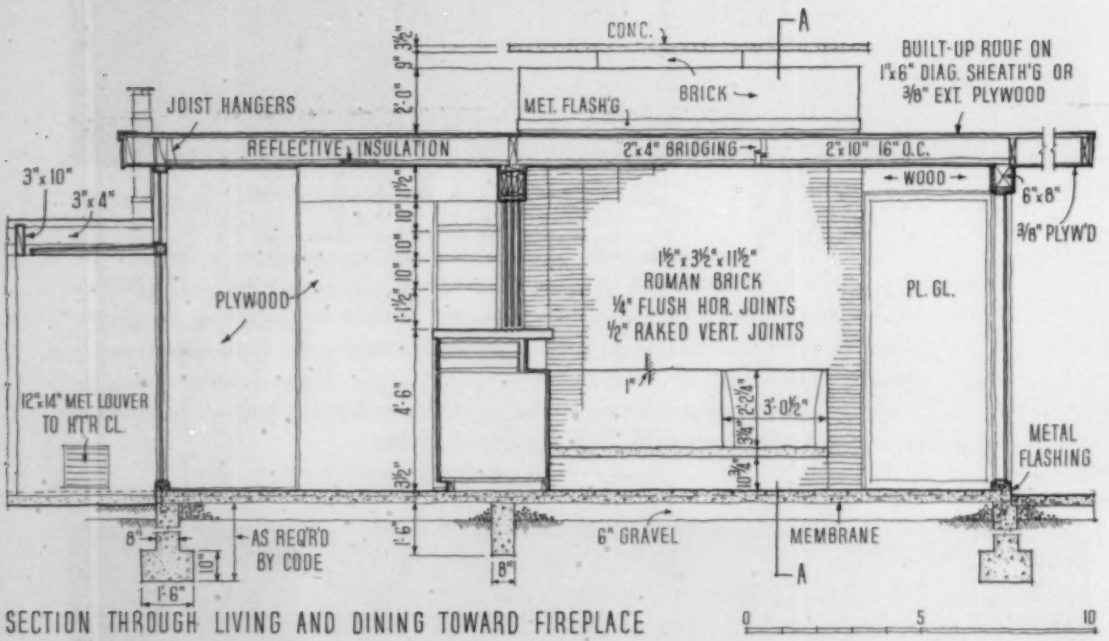
Lower panels of glass wall in dining space are intended to be translucent patterned glass in an actual subdivision; for exhibition clear glass was used

Ezra Stoller Photos

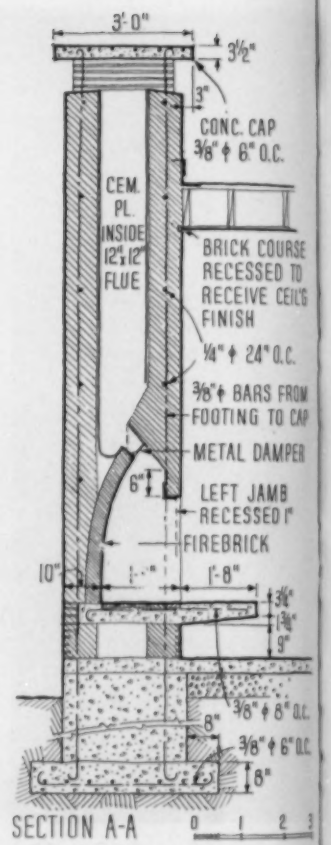
Using conventional materials and construction techniques, the designers have produced a house of unusual spaciousness and flexibility. The parents' bedroom — or library-study-guest room — can become part of the living room; the children's suite can be two bedrooms, bedroom and playroom, or parents' room and child's. Even the kitchen can be opened to the living room, a facility sure to be appreciated in the course of after-dinner entertaining, by sliding aside the panel over the long case which is used instead of a wall to define space. Another refinement, appropriate where waste collection is a problem: the incinerator built into the chimney, accessible from kitchen and terrace

Ezra Stoller: Pictor

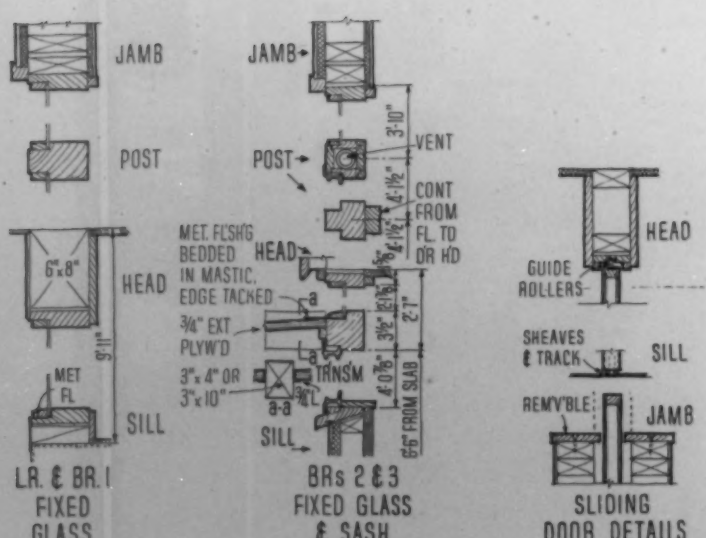
L-shaped kitchen, close to "front" door, also opens to garage; laundry equipment is accommodated at one end



SECTION THROUGH LIVING AND DINING TOWARD FIREPLACE



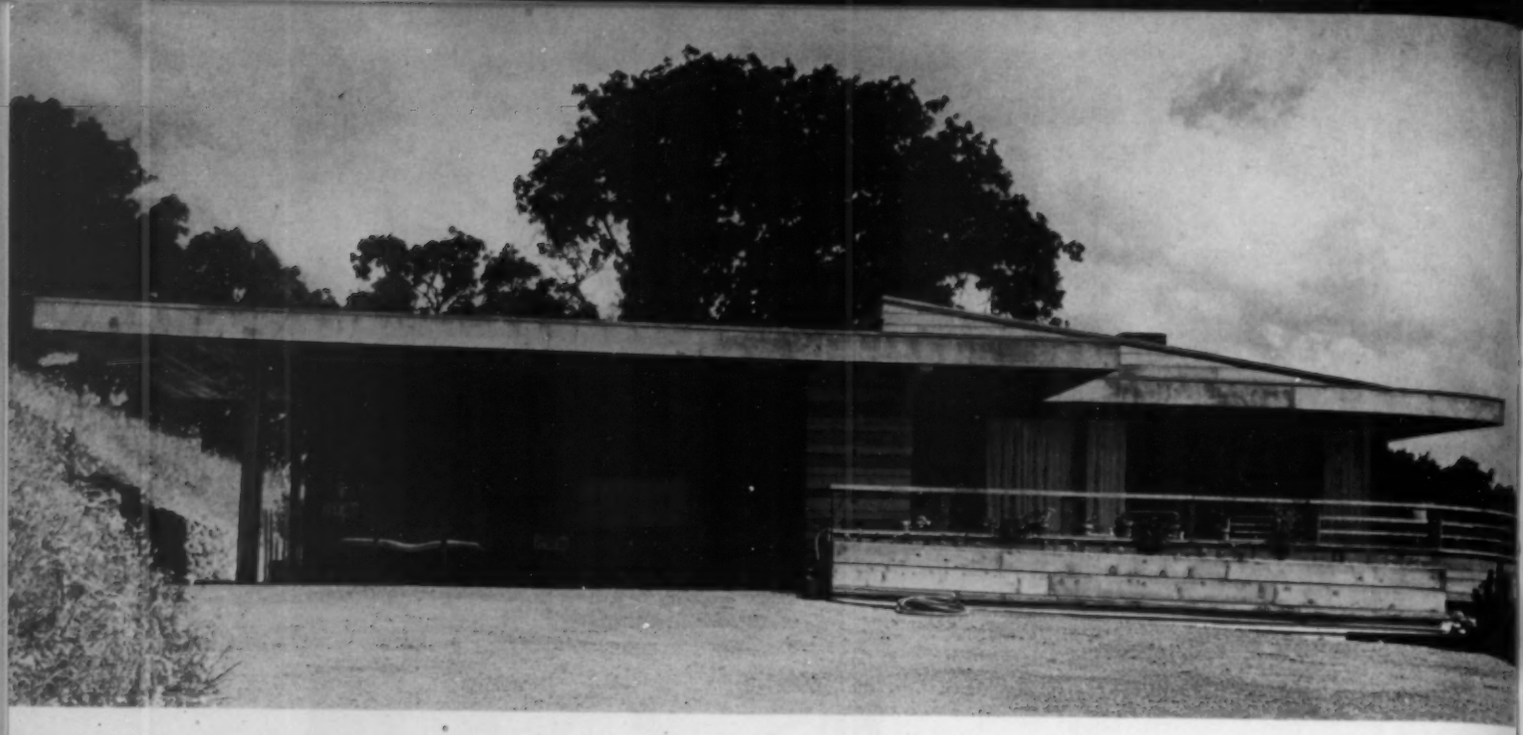
SECTION A-A

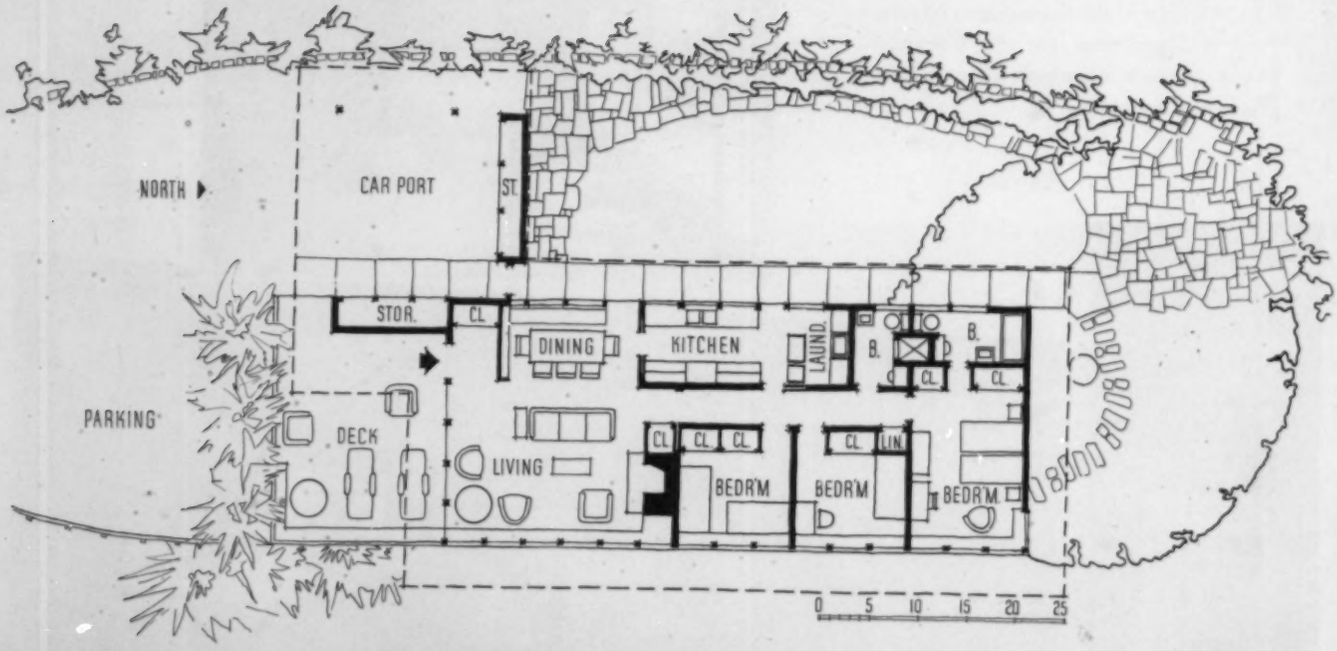


Details demonstrate the ingenuity with which standard materials and techniques are employed to produce a livable house. For example, the base (detail below), the ultimate in simplicity, covers the joint satisfactorily, keeps furniture or vacuum cleaner from marring the wall, avoids the heaviness of the usual form, reduces cost, yet construction is quite conventional dry wall, with striated plywood on the exterior

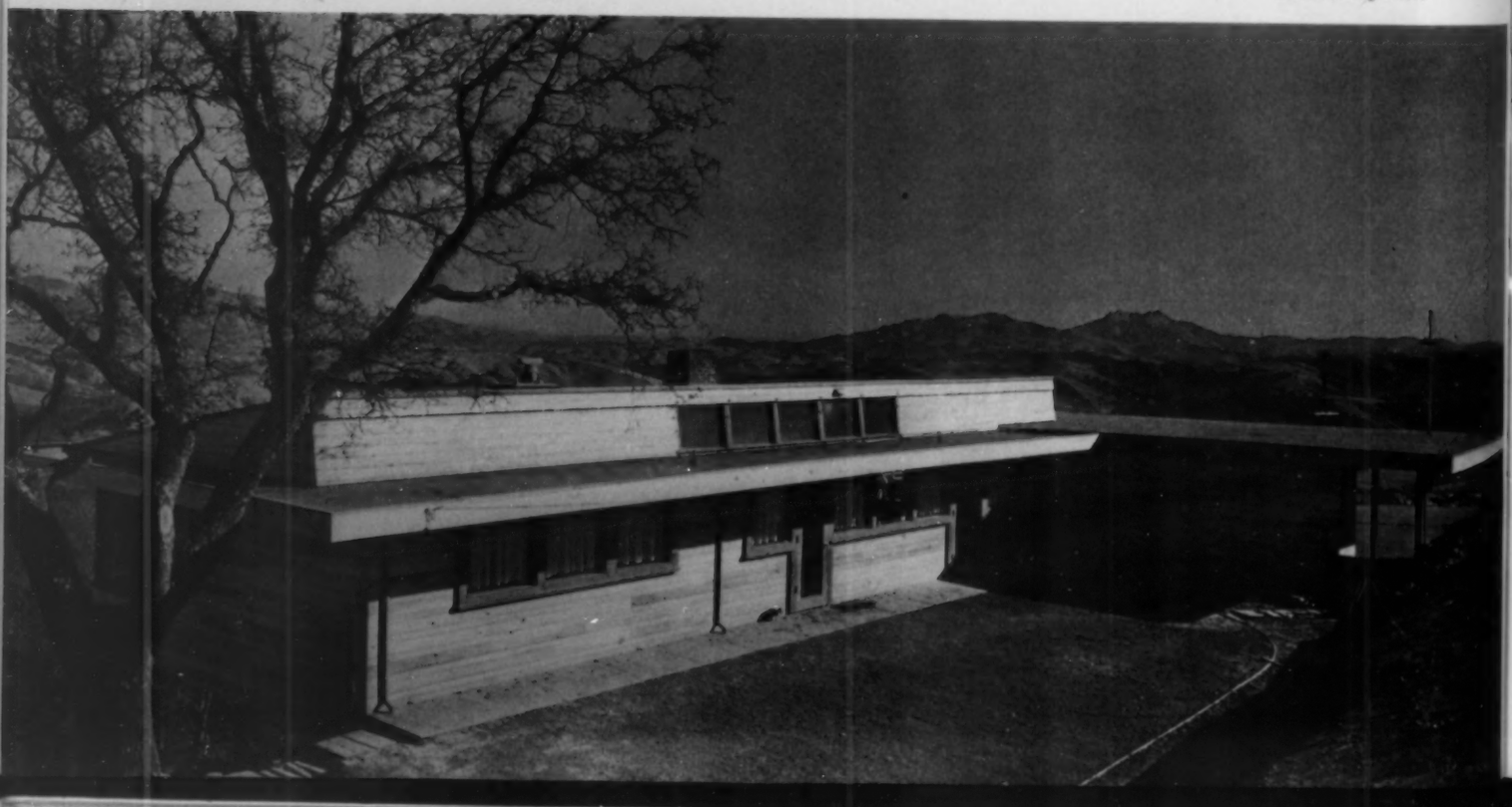
Ezra Stoller Photos

Top, parents' room; right and below, children's suite, with one room set up as a playroom. Note pull-down lamps, strategically placed. House is built on a concrete slab, has floor radiant heating, is conventionally framed with 2 by 4's. A steel member supports roof framing over living room. Sheathing and all interior wall surfaces are plywood (interiors might be gypsum board). Walls and roof have reflective insulation which also serves as vapor barrier. The built-up roof is covered with white granite chips to reflect sun heat. Interiors and furnishings were selected by the Department of Architecture & Industrial Design of the Museum of Modern Art; Philip C. Johnson is Director of the Department; Natalie Hoyt is Coordinator for the Exhibition House. Builders: Murphy-Brinkworth Construction Corporation





Randal Partridge Photo



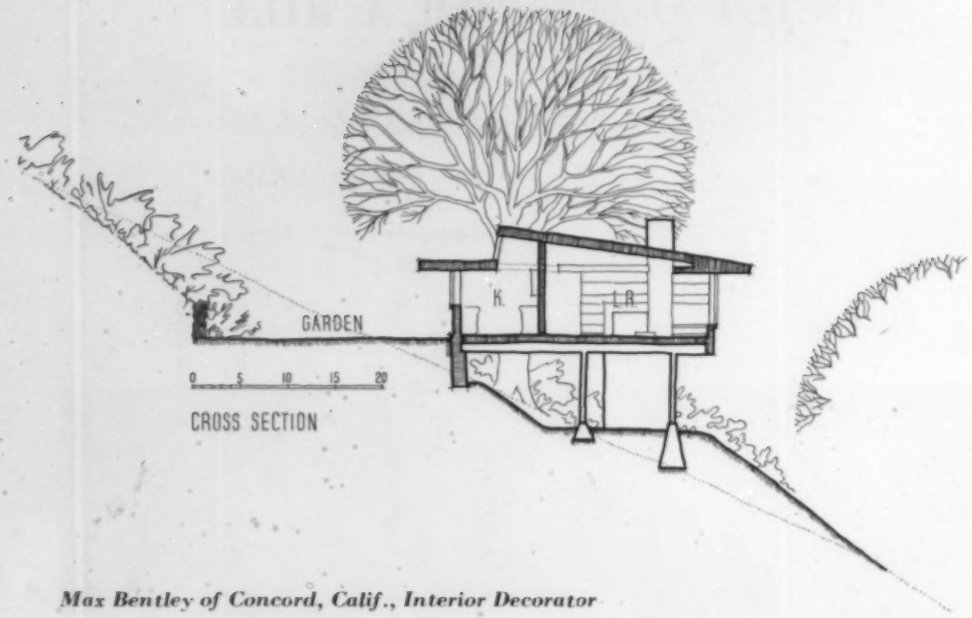
BUILT OUT FROM A HILL

Residence of Mr. and Mrs. Gaston J. Ley

Lafayette, Calif.

Fred Langhorst, Architect

THE SITE which in a sense this house does *not* occupy (it is built out from the hill, on posts) centers on a long, level graded area cut from the hill. Location of the entrance drive and carport at the south end of this plateau permitted the utilization of the entire level area for a sheltered garden, not yet planted in the photo opposite. The carport itself is used to shield the garden both from arriving guests and from summer and winter winds. An open deck at the southeast corner of the house serves as an entrance porch and flows visually into the open living room. Kitchen and bath are on the west side of the house; living room and all three bedrooms face the view.

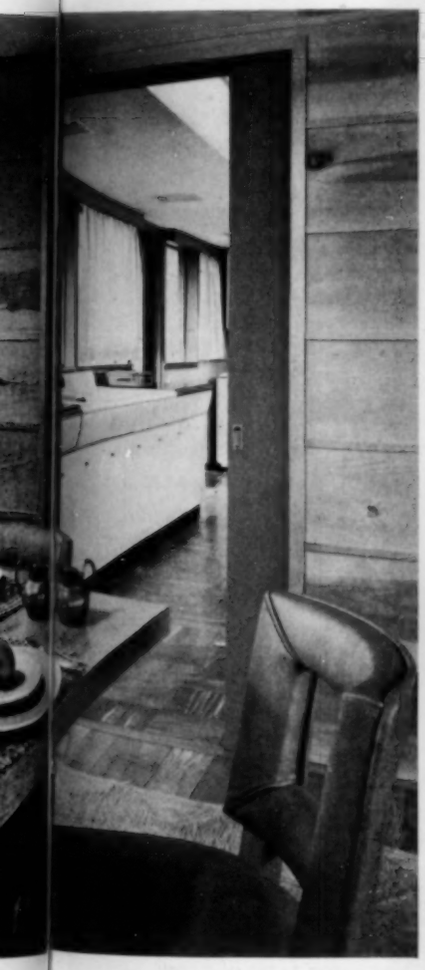


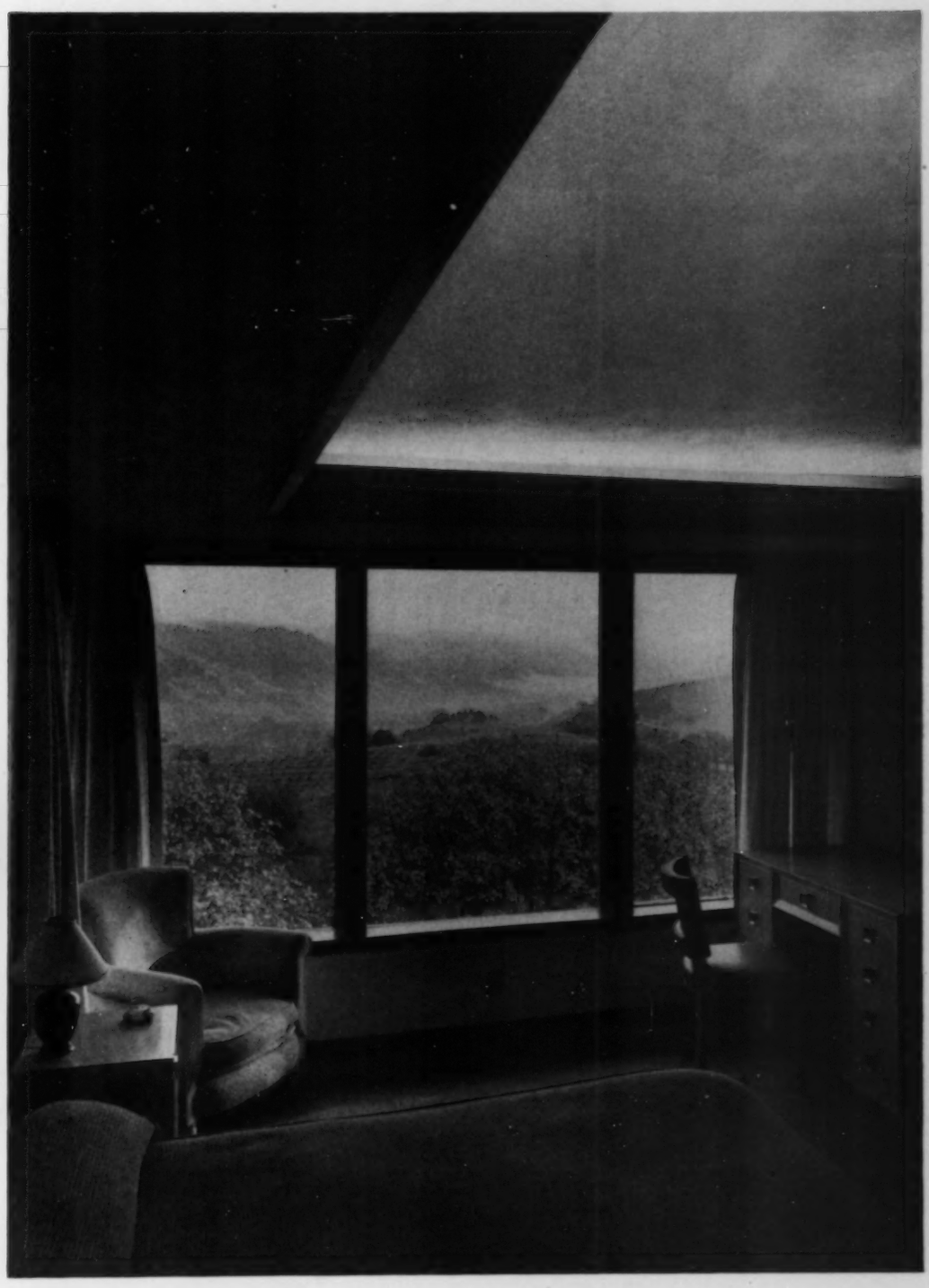
The house, built on posts, seems to reach out from the steep hillside toward the dramatic view of valley and mountains. Diagonal bracing required for earthquake resistance is incorporated into the horizontal plane of the floor and transmitted to west retaining wall. This leaves under-house area free and open for use; bedrooms may be added here in the future. Two-element roof adds interest to house profile, permits contrast of scale in interior between low-ceilinged entry and dining area, lifted ceiling of living room

Max Bentley of Concord, Calif., Interior Decorator

Rondal Partridge Photos

The random-width horizontal cedar siding of the exterior carries inside throughout the dining and living areas, where it contrasts with the brick fireplace and plastered ceilings. High dish shelves separate the entrance hall from the dining alcove on the west side of the living room. Lighting is indirect, from light shelves; at night, says the architect, it "creates a lifted ceiling effect, or vertical space-extension, and compensates for the horizontal space-extension which is lost when the window drapes are drawn." Radiant heating coils are in the ceiling.





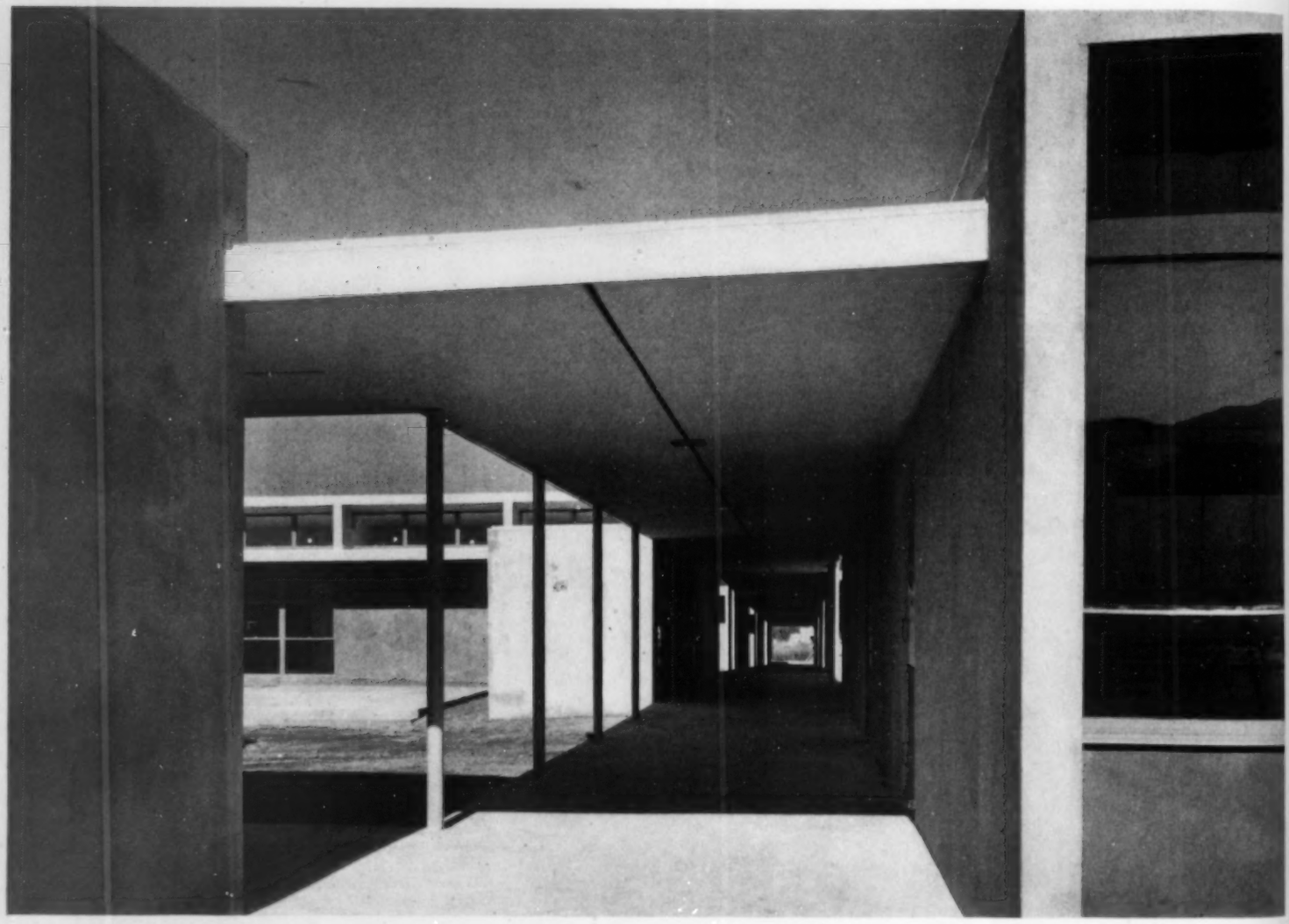
BETTER SCHOOL LIGHTING WITH CEILING LOUVERS

THIS is the first completed school using Lyndon's large ceiling louvers described in the RECORD in January, '47. Several others have now been completed and exhaustive tests have been made. The louvers, on the south side, bring in strong light at the interior side of the classroom, but block the direct rays of the sun. The curve of foot-candle readings (page 103) is quite flat and the readings, taken in February, are unusually high.

Apperson Street School, Los Angeles

Maynard Lyndon, Architect

Merge Studios Photos

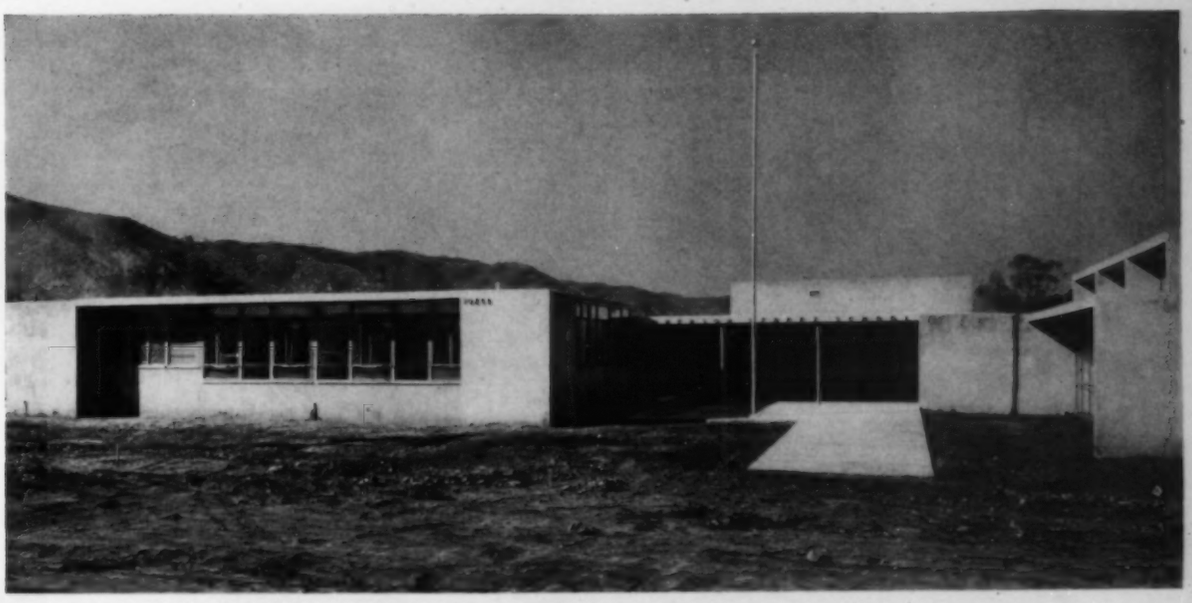


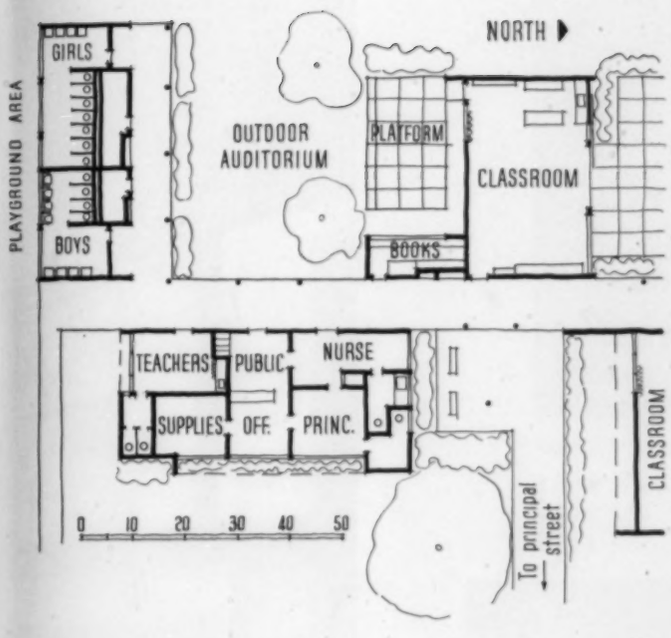
Actually the light is better in the interior than at the north wall, which is virtually all glass.

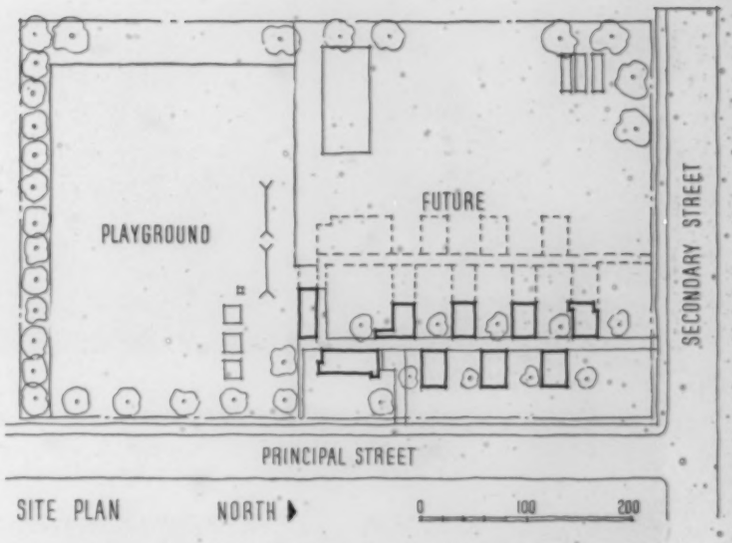
The south wall of each classroom has one glass-wall section, designed deliberately to allow some southeast sunlight to enter the classroom in the morning, mainly for psychological effect. Curtains can be drawn when the class is at work. Then the louvered lighting obscures a direct view of the south sky from any place in the classroom.

Mr. Lyndon points out that the louvers are economical and easy to install, and may be lifted out for repainting. Also that the large opening makes it possible to operate the clerestory windows without special mechanism. There is nothing for the teacher to bother with or adjust for control of the light.

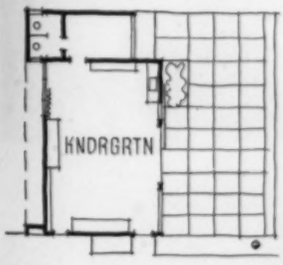
Corridors at this school, Apperson, run north and south; classrooms are staggered along this open corridor. Classrooms here are 24 ft wide. The same type of room was used at Meiner's Oak, Ojai, with east and west corridors and classrooms 30 ft wide; and again at Oak View, Ojai, with 30-ft classrooms and north and south corridors.

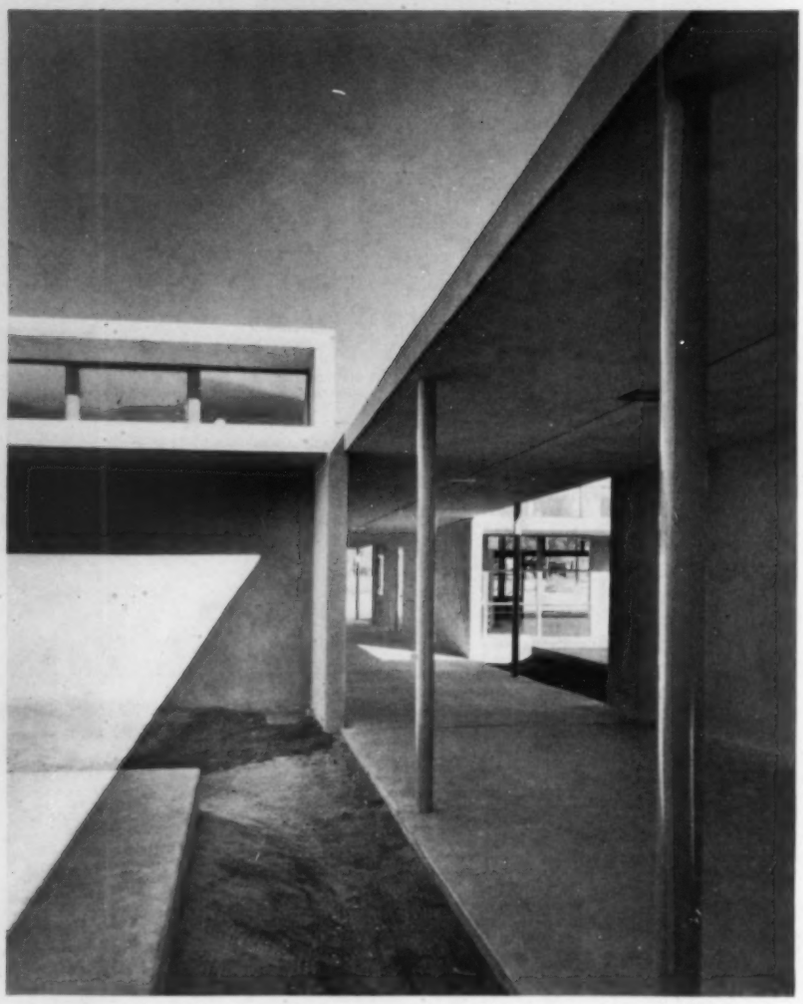




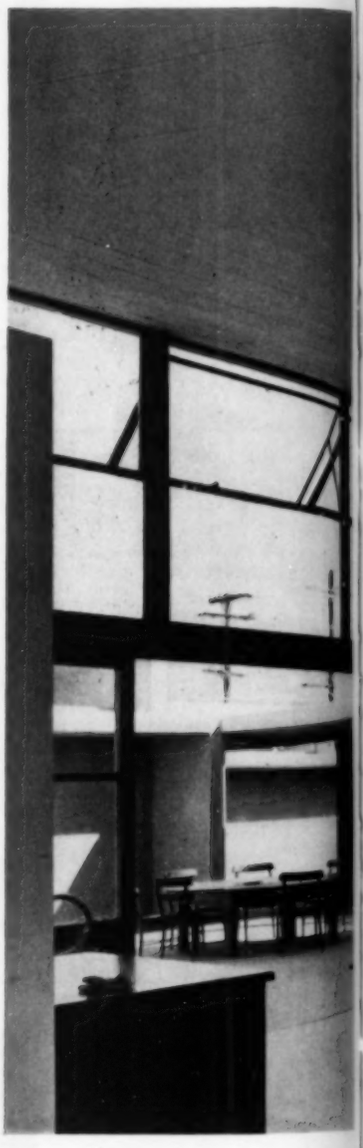


Classrooms at Apperson are staggered along a north and south corridor. Large ceiling louvers control light on south side; north has all-glass wall. Outdoor classrooms paved

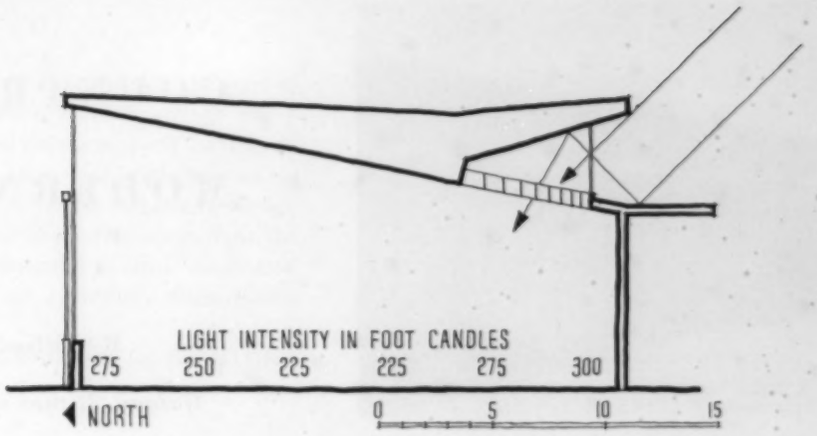




Merge Studios Photos



Corridor columns in fire-engine red accent sharply with the monotone of concrete. Below: each classroom has a sunshine window in the south wall, with drapes

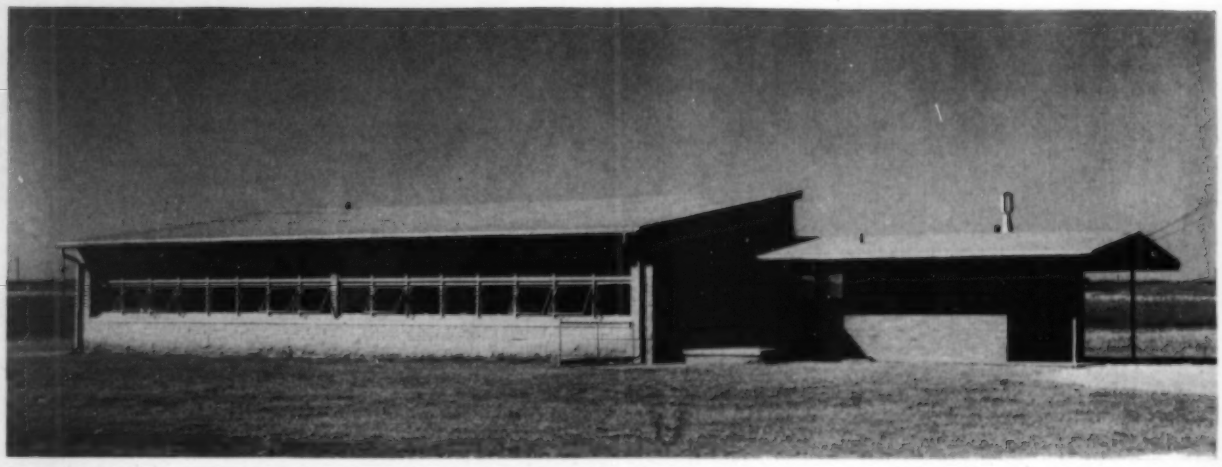


The photographer bears out the message in the diagrammatic section above —the classroom is actually lighter on the "inside" than on the window wall. Notice that besides giving a very "flat curve" the foot-candle readings are extremely high. The readings were made at noon on a day in February

COUNTRY SCHOOL MODERN VERSION

R-9 School, Cowley County, Kansas

Ramey, Himes and Buchner, Architects

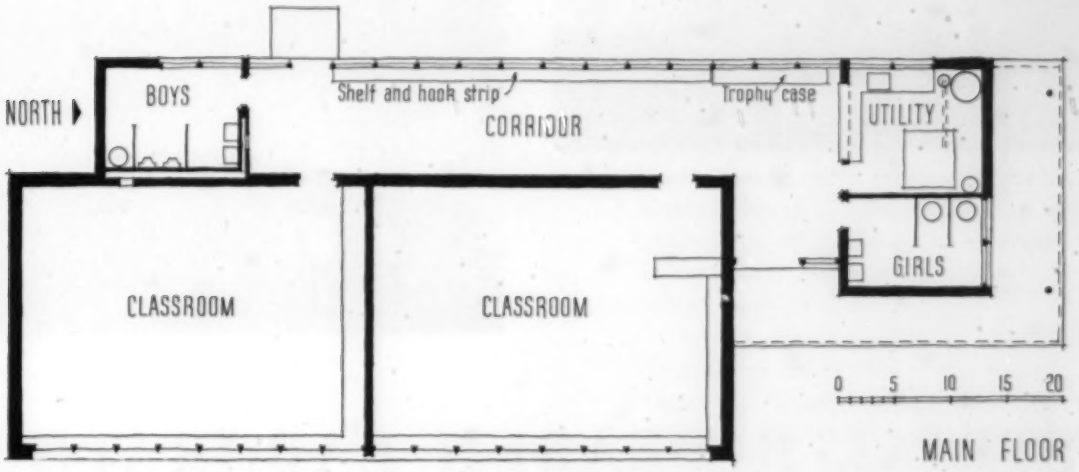


THOUGH it required some salesmanship on the part of the architects, here is an exemplary result for a typical problem. Three school districts, each having an outdated one-room school, were consolidated, as in many another rural county. But the refreshing design and bilateral lighting required some demonstration; the architects finally built a scale model to show its merits. Now the township citizens are extremely enthusiastic about their new structure.

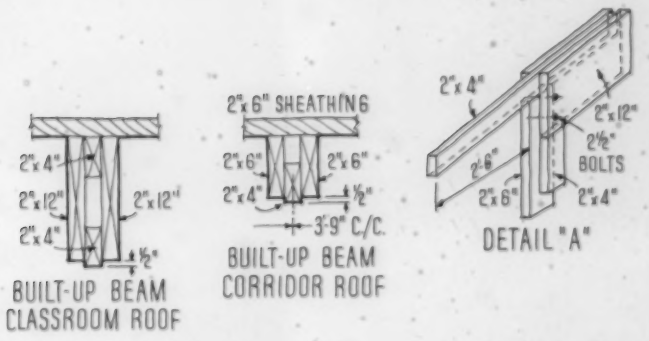
Plans originally called for a fieldstone for the exterior, but a local cut stone was used as it was cheaper. This stone, a light yellow beige in color, contrasts well with the red common brick on the corridor and service side. Exterior doors are painted a strong blue-green.

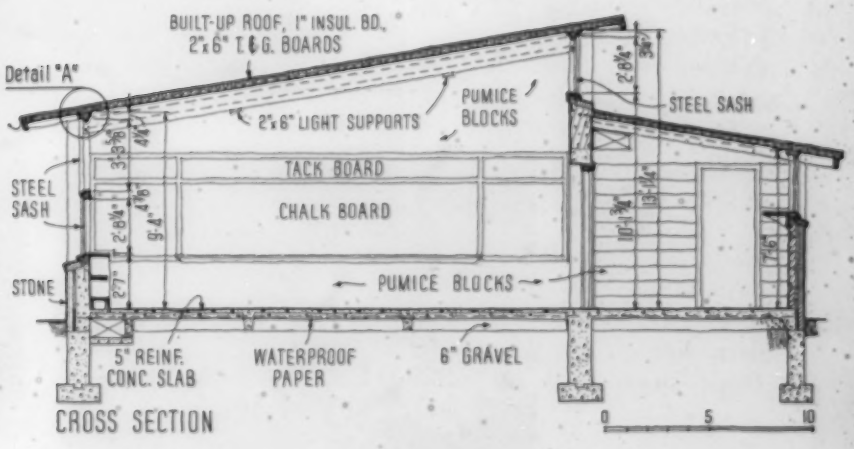
Interior pumice block in the corridor is left unpainted. Classrooms are painted in greens, yellows and beige. Chalkboards are green glass, tackboards are natural cork.

Structural system employs simple built-up wooden beams (details below), which, with the roof boards, are left exposed for the classroom ceilings; fiberboard insulation, 1 in. thick, above the roof boards.



Beams over the classrooms are built up of two 2 by 12's, and two 2 by 4's assembled as in the detail below. Over the corridor a similar beam uses a single 2 by 4 and two 2 by 6's





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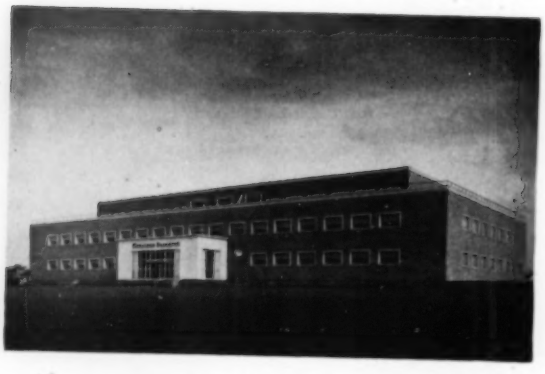


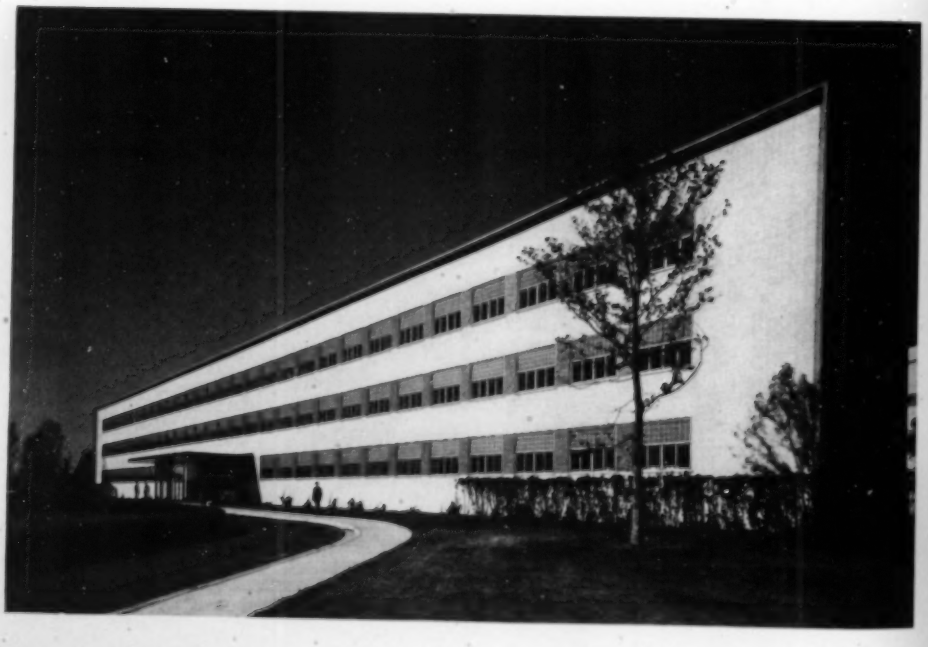
3

INDUSTRIAL RESEARCH LABORATORIES

ARCHITECTURAL RECORD'S

BUILDING TYPES STUDY

NUMBER 163



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5

PLANNING THE SCIENTIFIC LABORATORY

By Charles Haines

Voorhees, Walker, Foley & Smith, Architects

THE end of the war brought into sharp focus industry's need for research facilities. Industry found itself called upon to produce the products and economies that wartime researches had promised.

It has been generally conceded that ideally the research facilities should be separated from, but not too far from, the main manufacturing plant of the organization. Proximity leads to relying upon the research organization for the solution of many product control problems that can be more economically handled by the operating personnel. The main objectives should be the development of new processes and new products. Conversely, it is believed by the heads of many organizations that too great a separation is not only inconvenient but tends to have the research people fail to "keep in touch."

Usually, adjacency to the main plant means some interference with the work because of noise levels, vibration of industrial traffic, and smoke and dirt nuisances. Also there is often a lack of land upon which to expand and provide the necessary special type of auxiliary building.

Another need that frequently has been expressed is the desire to be located near some large university. Such an arrangement has the dual advantage of facilitating cooperation between the research organization and the university staff on special problems, and making easily available special courses and advanced study to the research personnel.

Finally, existing buildings seldom can be found that will provide the flexibility that is almost universally demanded. Flexibility is readily incorporated in new buildings without measurable increase in cost. Actually, if the design is approached with care and understanding, flexibility can reduce the initial cost, by reducing the quantity and scope of services that otherwise might have to be installed in such a building.

Dr. H. H. Race of the General Electric Research Laboratory stated the case for flexibility well when he said, "If there is one thing we know, it is that we do not know now what we will be doing ten years from now. . . . Furthermore, the project method of attacking research problems requires the efforts of individuals having many kinds of specialized training. Flexibility in personnel assignments is necessary in order to focus on a particular job at a particular time the required physical, chemical, metallurgical, or other specialized knowledge."

Research laboratories are fundamentally one of the more expensive types of modern commercial construction, for several reasons. In the first place, many phases of research require unusual and variable states of air conditioning. Special furniture, fume hoods,

1. Sinclair Refining Company research and development laboratory, Harvey, Ill., The Austin Company, engineers and builders. 2. First unit of General Electric Company research laboratory, Schenectady, N. Y., Voorhees, Walker, Foley & Smith, architects. 3. Firestone laboratory, Akron, Ohio, Voorhees, Walker, Foley & Smith, architects. 4. Standard Oil of Indiana research laboratory, Whiting, Ind., Holabird & Root & Burgee, architects. 5. Esso Standard laboratory and office building, Baton Rouge, La., Voorhees, Walker, Foley & Smith, architects. 6. Esso research center, Linden, N. J., Voorhees, Walker, Foley & Smith, architects

Photo credits: 1 and 4, Hedrich-Blessing; 2, 3, 5 and 6, Sigurd Fischer

6

cabinet work, compact storage facilities, and similar furnishings are a major item of expense. Thirdly, there are the many services which must be brought to the laboratory bench, and all services must be arranged to be easily installed in all of the laboratories. Again, the structure itself is more costly because of the addition of service shafts, slots, service trenches and provision for attaching quite heavy loads to all laboratory partitions. Finally, a laboratory demands built-in safety features, such as safety showers, additional exit facilities, automatic fire alarms, special grounding systems, and in many instances explosion-proof outlets and fixtures.

It follows that early obsolescence of such a structure is also very costly. In order to minimize obsolescence, the time required to plan should be utilized fully; the structure and other materials should have a long useful life; the planning of the building should represent the latest thinking, but it should not include fads for the sake of modernism; a rational program of expansion should be included even if the current thought of the owner indicates little likelihood of such expansion; and the amenities must be given careful consideration. Too often tomorrow's buildings are designed today to provide for yesterday's needs.

Five of the steps in the design of research facilities will be discussed. These are:

1. The development of the program.
2. The selection of basic conveniences.
3. The derivation of the module.
4. The planning of the building.
5. The development of the structural, mechanical and electrical systems.

1. *The Development of the Program*

Prior to any drafting or design, the program should be fully developed. Basically this should consist of a survey of existing facilities, visits to other similar laboratories, the development of the requirements, and a fairly detailed report.

Most clients will present the architect with the cost of the project, the net area required, or the gross area, or description of the facilities to be designed, and the number of people to be accommodated. The doctor arrives and finds that the patient has not only diagnosed his ailment, but has prescribed the remedy, and little is left but to effect the cure. Certainly it is the owner's prerogative to determine the amount of money to be devoted to the project. He alone knows how many people he intends to accommodate. However, the need may not be consistent with the cash available. The resolution of these two opposing forces can be accomplished most readily through the development of a program. Most other buildings can be designed directly with only a few basic requirements as to type of construction, size, a site survey, and the amount to be spent, but not laboratories.

Architects are familiar with the difficulties arising out of designing a house to fit the size of the husband's pocketbook and meeting the needs and desires of his wife. The laboratory client keeps a harem! The client's building committee usually represents the men with the purse strings. Shortly thereafter the real occupants of this house start to appear — the scientists, the technical service men, the head of shops, the administrator, the safety engineer and the operator. These groups are all alive and alert to the ideas that will simplify their particular problem, a good many of which necessarily will conflict with the interests of the others, and all having a great deal to do with the ultimate cost of the project.

It then becomes apparent that a little time spent in carefully analyzing the problem will save many man-days of drafting time and repeated revisions during the drafting stage.

The architect can help immeasurably in assisting the self analysis that is required to prepare the program.

Questionnaires and physical inspection are the recognized method of rapidly determining the needs. If there is an existing laboratory, and there usually is, the survey of this facility is exceedingly important.

While nearly all research laboratories present the same general problems, a good solution to the design of one will most certainly not fit all and may not be entirely suitable to any other. The chief variables are the type of research being conducted and the organization of the work. As a consequence an organization chart of the existing personnel is important. In comparison with this, a chart should be prepared showing the departments to be expanded and the numbers of personnel to be added.

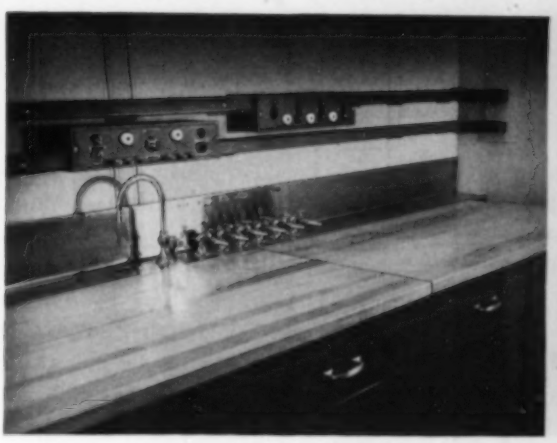
A survey of the net area devoted to each of the various functions should be conducted. This survey should describe briefly the dimensional and other characteristics of the space. The special facilities and number of people occupying the space should be listed. By inspection of the space and interview of the occupants, an attempt should be made to evaluate the degree of crowding and the need for facilities not now provided.

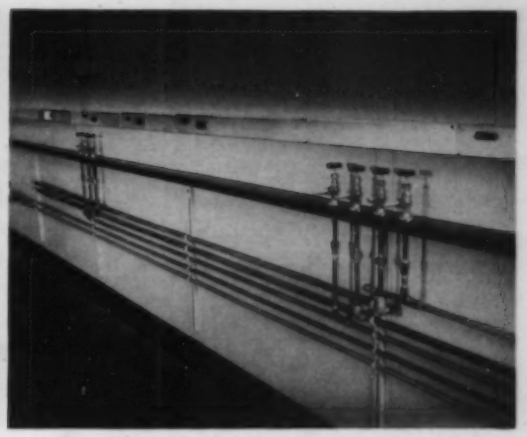
A separate survey should be conducted on utilities. The data to be obtained should be the source, characteristics, amount used in the laboratories or for process work and available existing capacity.

Visits to other similar laboratories are quite helpful. But they should not be made until some of the survey work has progressed, as the full value from such visits can be obtained only if there is sufficient background to compare and evaluate the advantages of the various laboratories.

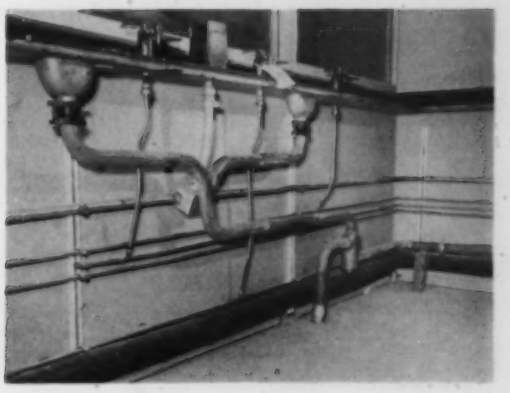
At this point an intelligent development of the requirements may be made. The space survey is evaluated for satisfactory working conditions. If overcrowding is apparent the net area per person should be adjusted, then an approximate required total area obtained for each department in the organization chart and for each type of space encountered in the space survey.

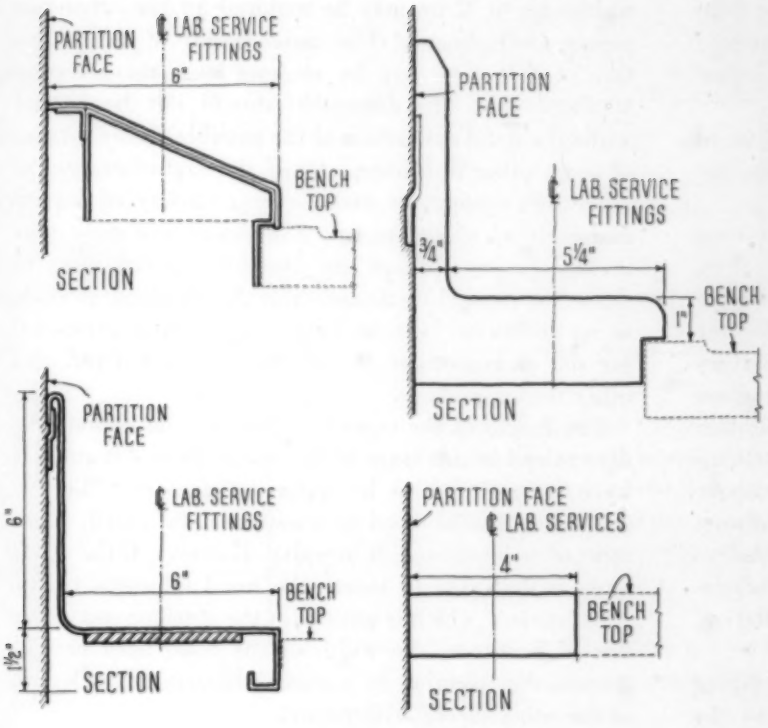
At this stage an opinion as to the probable cost can and should be expressed. This educated guess should not be dignified with the term "estimate." At least an indication can for the first time be given as to the





Sigurd Fischer Photos





Service strips in photos and details. Photo upper left shows stainless steel service strip in General Electric Laboratory, upper right is carbonized wood service strip in Bell Telephone laboratories, Murray Hill, N. J., Voorhees, Walker, Foley & Smith, architects. Lower photo, drains and piping below service strip at Tennessee Eastman lab, Kingsport, Tenn., Allen N. Dryden, architect. In the details, the service strips with lip projecting over bench top are better for chemistry labs, those with flush joint more commonly used for physics laboratories

general direction of the expenditure. It is better to prepare this kind of cost data than to provide estimates from inadequate drawings, as they probably are as accurate. Much effort and design cost can be saved if the requirements are evaluated in terms of dollars while the needs are somewhat flexible.

The "guesstimate" can be made up in the following subdivisions:

Building

Utilities (including additions or new facilities for steam, power, water and sewage)

Site Development (roads, landscaping, fences, walks)

Occupancy (laboratory furniture, laboratory services within labs., installation of owner's special equipment, furnishings for special spaces)

Auxiliary Buildings (gate house, pilot plants, garage).

The opinion as to the cost of the building can be determined by assuming that the net area will be approximately one half of the total gross area, and multiplying this by a suitable factor for the cost per sq ft of gross area. Research buildings vary in the per cent of net area to gross area from 40 to 60. Such a wide variation would appear to have a much greater effect on cost than it actually does. It usually happens that when the gross area is kept to a minimum, by eliminating basement area and reducing the building equipment space, the unit cost per sq ft rises rapidly and inversely. Most low cost guesses originate from failure to be conservative as to the total gross area of the building.

2. *The Selection of Basic Conveniences*

Before the space module can be determined, or really any of the structural, mechanical or electric basic decisions made, it is necessary to examine the basic conveniences of the laboratory.

Then follows determination of the method of running services within the laboratories; the selection of the fundamental furniture type; the decision as to the typical arrangement of furniture with respect to fenestration; the determination of the typical aisle width and development of policy and layout with respect to desk space within the laboratory. All of these, of course,

have many alternatives and exploration of all of the possibilities can run into thousands of combinations. Presentation to the owner of a few chosen alternatives without regard to the other variables, probably will bring about quick acceptance of the several more desirable solutions.

Where laboratories require drainage, the most frequently used method of distributing services is the so-called service strip. This system consists of racking the service lines below the surface of the laboratory bench. At intervals suited to the convenience of the laboratory worker, but on repetitive centers, short risers extend from the branches upward through a flat or sloping mounting for the laboratory fittings. This mounting of service strip may consist of anything from a simple rectangular section of hard wood supported from the wall on shelf brackets, to complex stainless steel sloping sections.

This arrangement of piping requires 4 in. to 8 in. of width, if large cup sinks, each with its own trap, are required.

The laboratory furniture under this service-strip system is not permanently attached to the services, and may have almost any degree of mobility. At locations where it is desirable to omit furniture for the installation of some free-standing piece of laboratory equipment, such as a centrifuge, a rather simple snap-on cover may enclose the service lines in order to maintain neat appearance and ease of maintenance. This scheme of service piping does not preclude the placing above the bench top of an electric plug-in strip, or wireway, nor does it interfere with the use of reagent shelves supported from the wall. It has the additional advantages of flexibility and economy of initial installation, coupled with ease of adding unforeseen services.

Another commonly used method of concealed piping is the attachment of the laboratory services to the back of the furniture. Such a system presents some difficulties in providing support and concealment when it is necessary to break the continuous line of furniture. A seal between the wall and the top of the furniture is not readily obtained, nor can the furniture units be readily rearranged. It should be noted that this method does not materially change the floor area consumed by service piping, inasmuch as the same width of work top, which is cantilevered to receive the cup drains and fittings, must be used as in the service strip method.

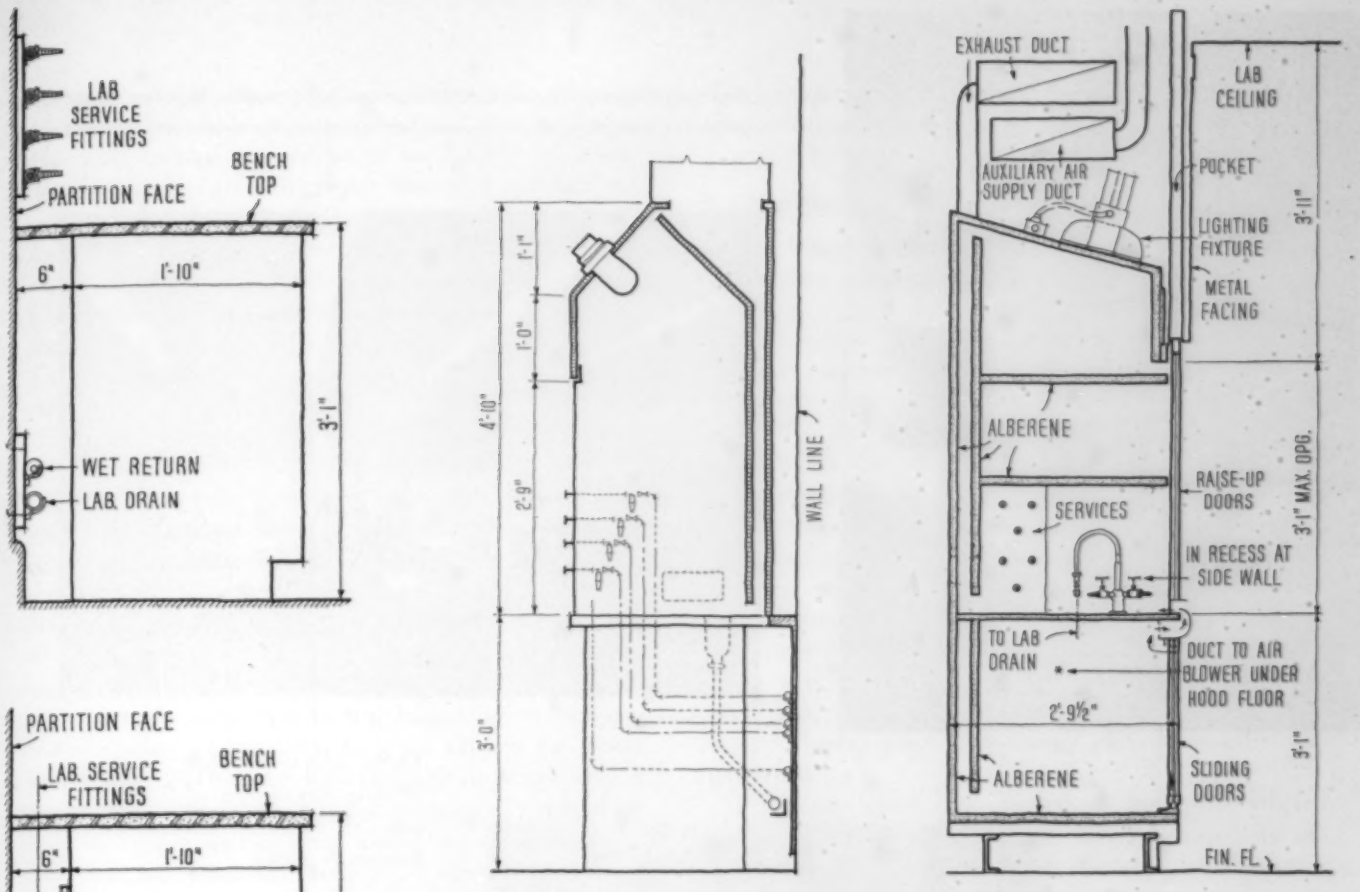
The other method frequently employed is the over-bench method. This system is particularly suited in laboratories in which the services are entirely of the dry type — i.e., electric, gas and air — or in which the water and drain facilities are limited to a location adjacent to a wet column. Here the services are merely attached to the wall at standard height above the bench. They usually are not concealed, although they may be by means of a snap-on metallic housing. The laboratory fittings protrude directly from the tees in the lines at predetermined centers. There is an apparent saving in floor area since the work top returns to the wall surface. In reality, there is no substantial saving of floor area, since the rear 6 in. of the top is not available as a work area because of the protruding service fittings. If the service lines are raised to a sufficient elevation to permit the use of the rear portion of the work surface, they become inconvenient, and if a shelf is required above, this is also inconvenient. The number of services that may be installed above a bench top is seriously inhibited.

In the early stages of design development the fundamental furniture types and the approximate size of typical isolated pieces of laboratory equipment should be determined. The width of the working surface has an important bearing on the area of the laboratory. It has been found that in buildings employing service strips a width of 25 in. is usually quite adequate, whereas widths up to 32 in. may be required for the other two piping arrangements. The usual height of bench surface of 3 ft 1 in. has for so long been the accepted standard that this dimension should not be altered without careful evaluation of the possible disadvantages of some other dimension. All of the manufacturers of laboratory equipment make a large variety of drawer and shelving arrangements. Experience will show that in any project, except the smallest, special sizes of drawer units and cupboards may be obtained at little or no additional cost, so long as freedom is permitted for the manufacturer to use the standard depth and other trade practices.

The length of the repetitive furniture unit should be determined at this stage in the design. Both 4 ft and 5 ft have been found to be quite satisfactory. The all-purpose chemical hood is sometimes too small, if restricted to less than 5 ft in width. However, if the client finds it desirable to locate the hood adjacent to the exhaust riser, which is usually at the corridor end of the line of furniture, the width of the hood need not influence the selection of a smaller dimension in length of the other pieces of furniture.

It is desirable to have the repetitive grouping of laboratory fittings bear relationship to the length of the furniture unit. For example, 5 ft 4 in. will work quite satisfactorily as centers for laboratory fittings with a 4-ft furniture unit, thus three sets of fittings would serve 16 ft of bench. Another method is to use 4 ft as the furniture length and 4 ft as the repeat grouping on fittings, but having the fitting groups located on 8 ft centers. In this manner a 20-ft line of benches would have three groups of services with 4-ft blank service strips between, which could be activated in the future if required. It is also desirable to integrate the center lines of wall supports with the fitting groupings and the furniture units.

The fume hood is a necessary and expensive adjunct to research. Present practice indicates a minimum velocity of 75 ft per minute through the hood opening. In hazardous conditions this minimum may well exceed 150 ft per minute. It is thus apparent that one of the major influences on the design of the entire building becomes this determination of the exhaust characteristics. In most prewar laboratories only an exhaust system was provided, the supply air being made up from



Fume hoods above show, left, an inexpensive portable type made of asbestos cement board. One at right above is rather elaborate, is designed for full control of fume hood exhaust in an air conditioned building. Auxiliary air is supplied to the hood; room air is used only when the safety door is raised — a small blower maintains a high velocity blanket of air across lower part of hood to blow heavy gases into exhaust system

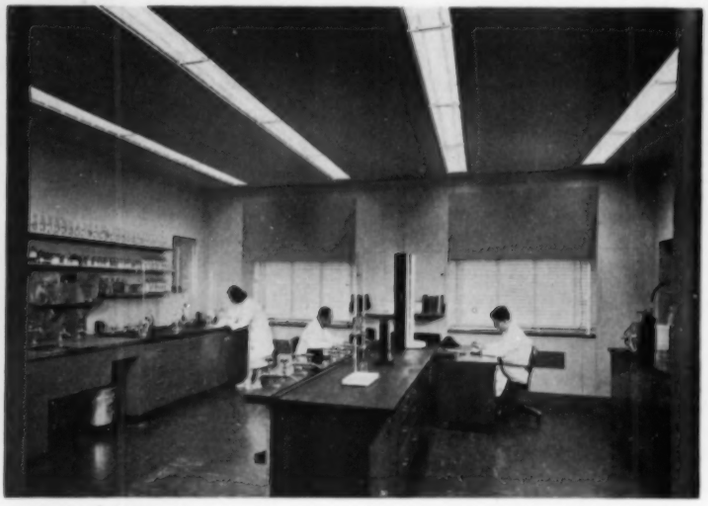
Sections at left illustrate two methods of bringing services in without the usual service strip, one above the laboratory bench, one along a panel under the bench top

infiltration. This practice limits the hoods to an inadequate number; places such a strong suction on the room that the doors are difficult to open, makes the laboratory uncomfortable in the winter from partially opened windows or just ignores the requirement of minimum ventilation standards. The increasing use of air conditioning has further complicated the problem of hood design. As the safety engineer raises the minimum air velocity through the hood opening, the scientist finds that the velocities within the hood cause great inconvenience when the hood opening is reduced by lowering the safety shield or door. As a consequence, either the volume of air taken through the hood must be reduced by one of several complex processes, or the air must be by-passed through the automatic opening of a damper in order to reduce the maximum velocity. Usually, in addition to being poisonous, the gases created within the hood may be highly explosive or extremely corrosive. These conditions add to the cost of the hoods the provision of corrosive-resistant materials and explosion-proof fittings and in some cases spark-proof fittings and materials. It is therefore advisable to examine the nature of the work of the project to find the minimum design acceptable for the bulk of the work and provide special hoods for certain specific uses.

Most current laboratory design places the furniture along walls perpendicular to the exterior wall. This is particularly true in those laboratories with natural illumination. Bench units on the outside wall interfere with the heating facilities and cause some difficulty with respect to running services, making the cleaning of windows inconvenient, and generally violate the concept of good lighting.

The aisle width between rows of fixture units is determined by safety and convenience. As the nature of the laboratory work is fundamentally hazardous, the workman feels somewhat more confident if he realizes that his involuntary reactions, caused by some unexpected happening, will not result in his backing into a more serious predicament. More and more, laboratories are making use of mobile measurement and testing devices, which of necessity must be stored in the aisle

Left: combination of fume hood and steam hood built in together. Corridor air is drawn through grill above door as supply for fume hood exhausts

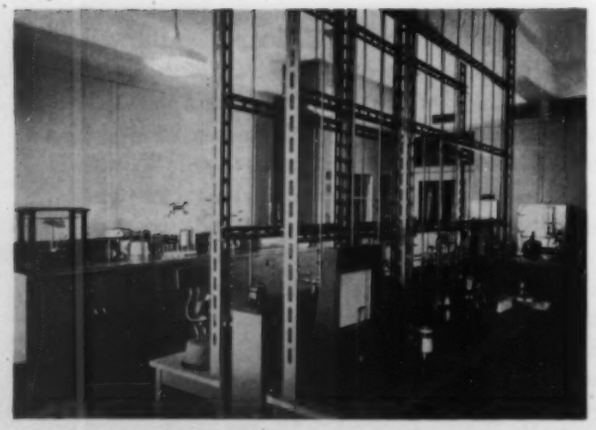


Hedrich-Blessing Photo

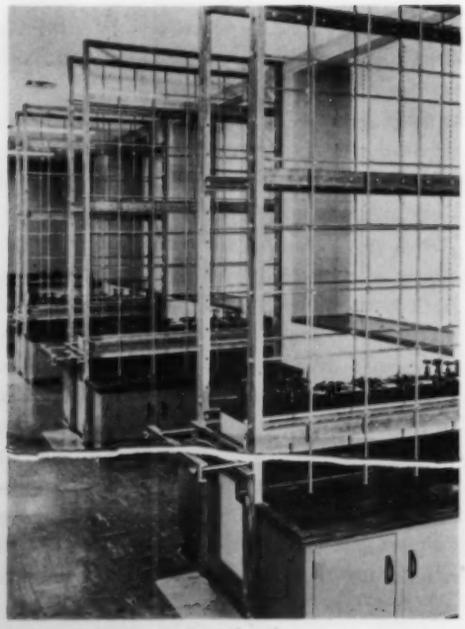
Troffer lighting in a typical lab, Whiting laboratories of Standard Oil; Holabird & Root & Burgee, architects

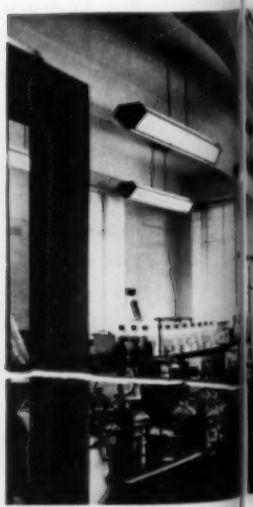
Nick Lazarnick Photo

Left: virus laboratory at Sterling-Winthrop research institute, Rensselaer, N. Y., Thompson and Barnum, architects. Exhaust air from special cabinets is treated with germicidal lamps in exhaust ducts before being discharged



Tennessee Eastman Corporation Photo





Above and right: distillation racks for supporting complicated arrangements of glassware. Above, at Esso research center, Linden, N. J.; right, at Tennessee Eastman laboratories at Kingsport, Tenn.

during their use. Since the use of the aisle except in routine analytical work is usually limited to the one or two occupants of this section of the laboratory, traffic does not require a width greater than that enabling two persons to work back-to-back conveniently. If the aisle is too wide, needless steps and inconvenience are added. The aisle should have a minimum width of 3 ft 6 in. and when the aisle exceeds 6 ft there is usually a waste of space and a decrease in the convenience. From 4 to 5 ft has been found to be satisfactory in most instances.

There is a divergence of opinion as to the desirability of providing desk space within the laboratory. The arrangements vary from providing knee space under one of the standard laboratory benches for convenience in taking laboratory notes, to providing separate desk space for each worker in the laboratory. Sometimes this desk area is separated by partitions from the remainder of the laboratory. The variations in the net area consumed are not great unless it is decided that no desk space is to be permitted for the laboratory technician. Such a policy is not common, even though the desire for utilizing every square foot available for bench work is great. The technician is required to spend so much of his time in report writing that unless these facilities are provided his efficiency suffers. A laboratory layout should be devised that will permit a large number of varying arrangements. It is not as uneconomical to provide separate one- and two-man offices across the corridor from the laboratory as it first appears. As has been stated, the area difference is not great. It can also be seen that if the offices are mixed in with the laboratory space a substantial amount of floor area is provided with the ready availability of laboratory services, heavier floor loadings, better ventilation than necessary, and the other characteristics of the more expensive laboratory space. Thus, the seeming economy of "universal space" is offset by the economy of building a smaller amount of expensive laboratory space and an adequate quantity with less costly office requirements. The argument for the office within the laboratory is greater supervision and convenience. The separate office provides a change of scenery, privacy and quiet.

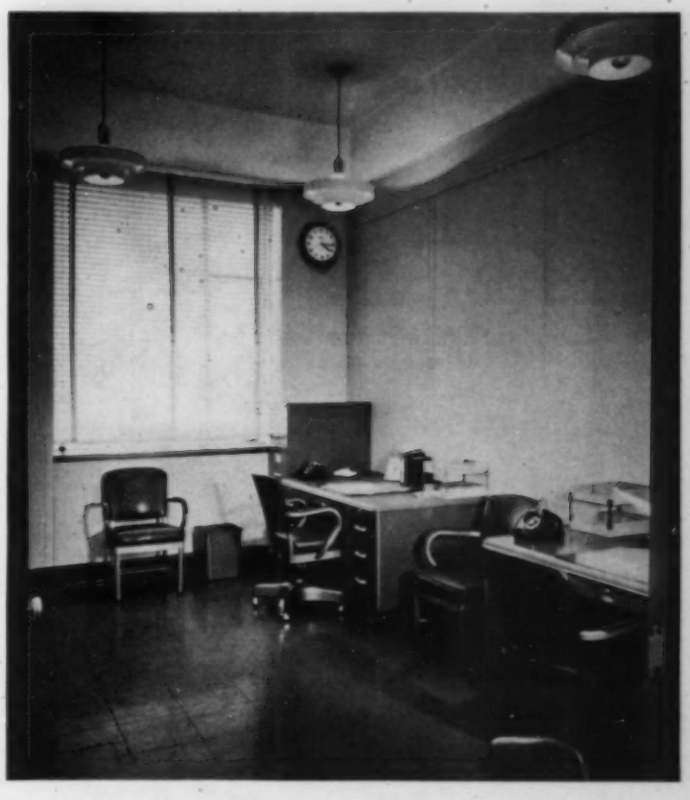
3. *The Derivation of the Module*

It is assumed for the purposes of this article that the advantages of module planning are recognized. There is, however, a great deal of confusion with respect to the term "module." We are concerned with the smallest repetitive unit of space. The module must be complete in its repetition of the characteristics that enclose and serve this space. The characteristics of this repetitive element are its three dimensions; its architectural, mechanical, electrical and structural features; as well as the services that may be added for the convenience of its occupant. The permanent features would include the floor, the ceiling, the exterior wall and the corridor wall; it would also include the heating, ventilation, and illumination, by both natural and artificial means. The conveniences that may be added for the assistance of the worker are those of water, drain, gases, steam, laboratory power, hood connections and the subdividing partitions.

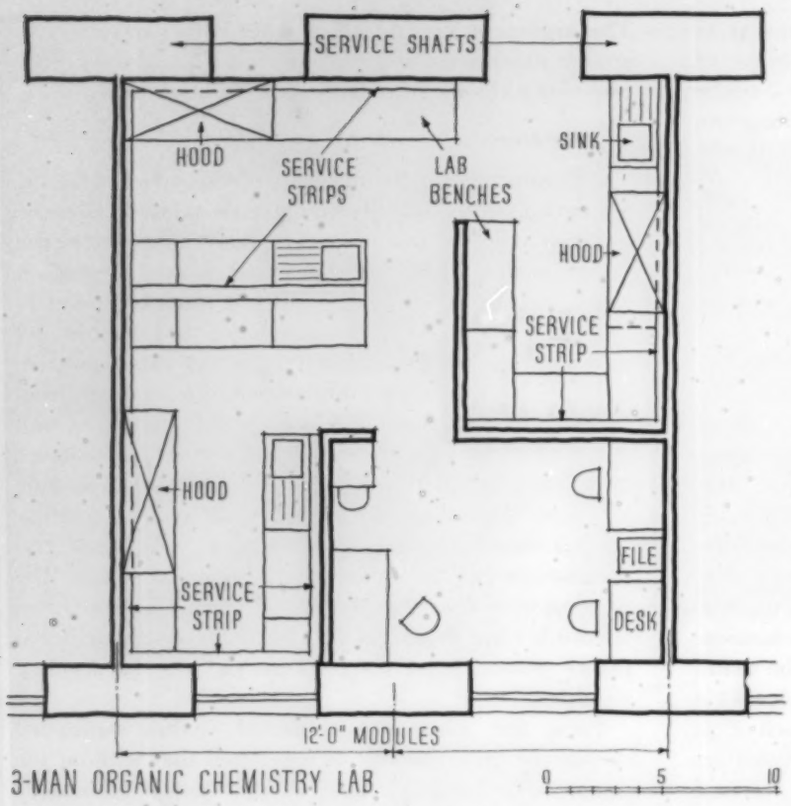
From the space and personnel studies conducted during the survey period, it was noted that without too much "shoe-horning" most of the typical laboratory type space could be accommodated in one or two standard depths. In determining this dimension, perpendicular to the wall, the consideration of typical length and number of units, the width of the hood, the length of a desirable island, or peninsular arrangement, the neces-

Sigurd Fischer Photos except where noted

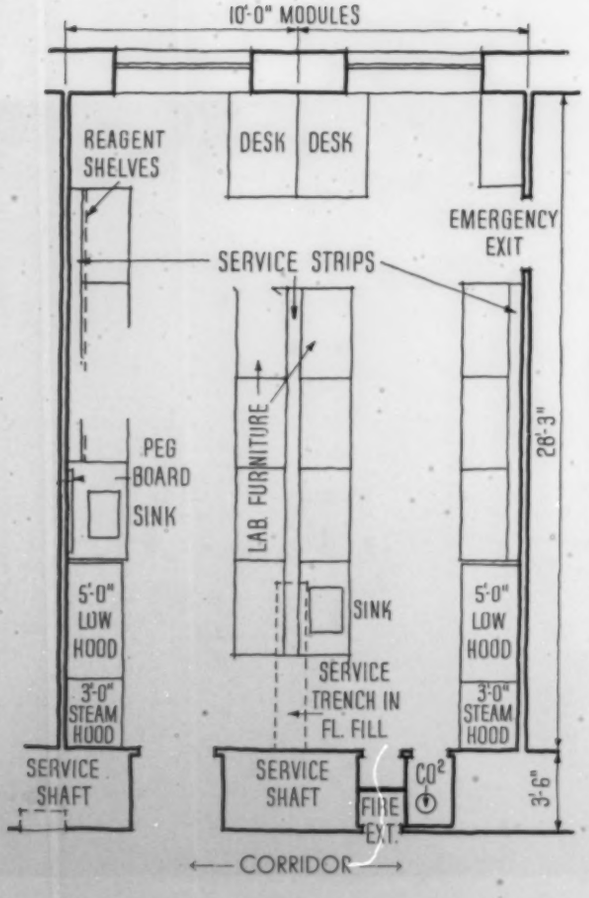
Partially indirect lighting at Esso laboratory, Baton Rouge, keeps brightness contrasts in comfortable range

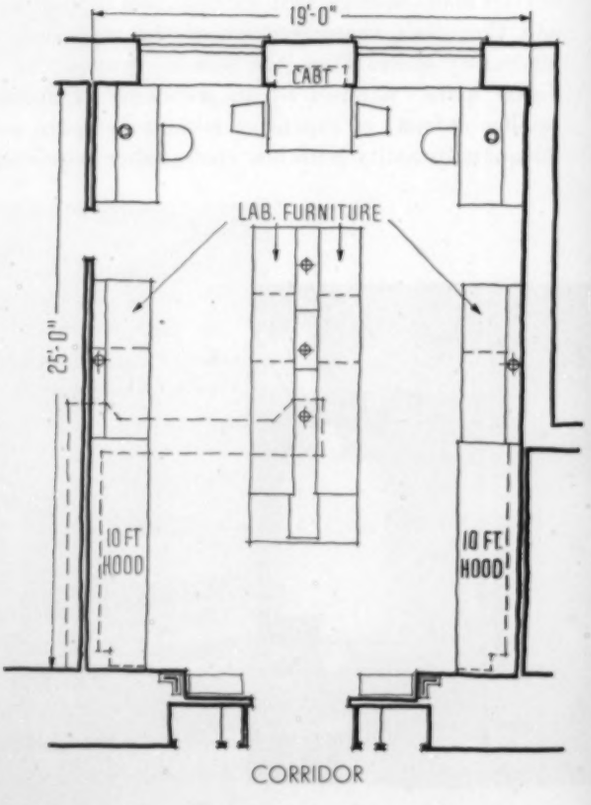


Right: laboratory space, Esso research center, here used for office space. Services are available from corridor when conversion for laboratory use becomes necessary



Some typical laboratory bays, all with some office space directly in the laboratory. Left: three-man organic lab at General Electric, illustrating partitioned office space. Below, left: four-man lab at Esso research center. Service shafts are on 10-ft centers, with short service trenches to the island benches. Space can be subdivided at each 10 ft; in four-man lab the extra door space is used for gas cylinders, fire extinguisher and clothes closet. Below, right: four-man lab at DuPont Experimental station, Wilmington. Island bench is serviced through floor trench, cutting number of service risers in half





sity for a second means of egress, and the location of the sink must be resolved.

In some phases of research, explosions and fires are almost unknown. In others, the potential of such accidents is ever present. In the former, if the laboratory is not too deep, a necessity for a second means of egress away from the corridor entrance may be eliminated entirely. In the latter type of laboratory, it has been found that a communicating door is the only acceptable solution. It is usually not necessary to have more than one such auxiliary exit, and if they are provided as a means of access to both adjacent spaces there is a tendency for these doors to be used as interior circulation. The number of bench units along a wall will depend in large part upon the nature of the work, 12 ft being quite adequate in many instances, with a maximum of approximately 24 ft. As a result, a deep laboratory with a dimension of from 24 to 28 ft will provide a number of satisfactory combinations as illustrated. A shallower laboratory dimension may be quite satisfactory at a dimension of from 14 to 19 ft.

The dimension parallel to the exterior wall can be determined quite readily after the decisions have been reached that are indicated in section 2 of this study. Fundamentally, this dimension of the module with respect to laboratory space is simply the sum of the dimensions of the following: one subdividing partition, two spaces for services, two worktops and one aisle. A satisfactory dimension will therefore be approximately 6 ft, plus the width of the aisle as determined under two above. The experience indicates that this dimension will vary from 9 to 12 ft.

Obviously, the third dimension of the module should be a constant regardless of how many different modules are developed. A dimension in the order of 10 ft will suffice for all office type of spaces and if metal partitions are under consideration, it is advantageous to select one of the standard heights. These are at 1-ft intervals, at 9 ft 3 in., 10 ft 3 in. and 11 ft 3 in. Except for very rare occasions where tall columns are necessary, the clear height of laboratory ceilings would not be expected to exceed 11 ft 6 in. This dimension can be encroached upon usually by such items as sprinkler heads, or lighting fixtures, as well as the structural beams and girders. Adequate hoods usually can be provided at approximately 10 ft.

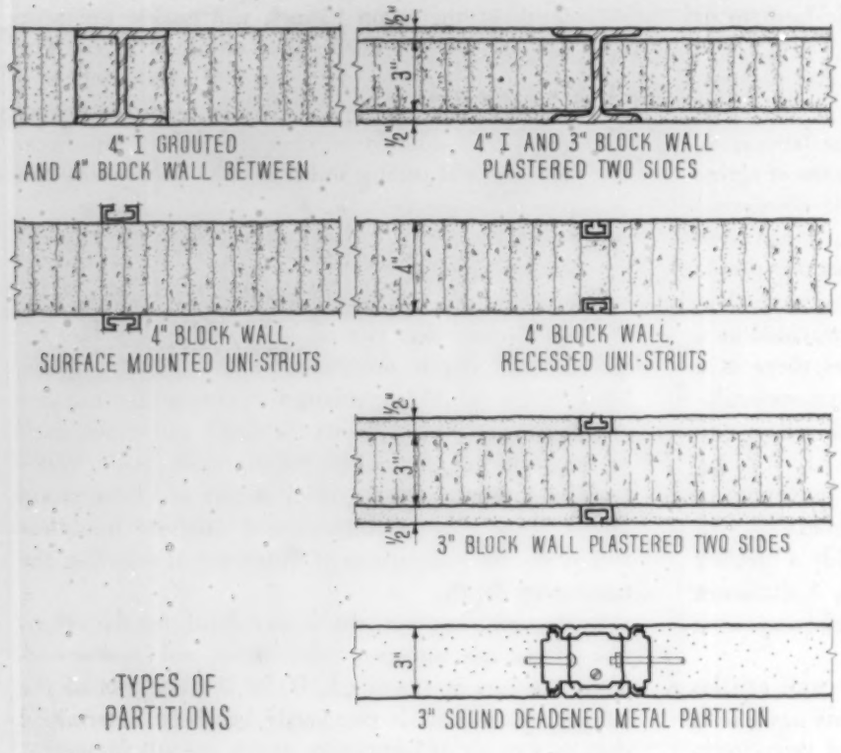
Distillation racks and several other similar types of equipment usually will require around 11 ft. A number of alternatives present themselves for treatment of the structural system as follows:

1. An acoustical hung ceiling at 10 ft 4 in. Any of the accepted structural systems will be satisfactory with this arrangement.
2. An acoustical hung ceiling at 11 ft 4 in. Any of the accepted structural systems will be satisfactory with this arrangement.
3. A beam and girder structural system with the soffits all at the same level at either 9 ft 3 in. above the floor, or 10 ft 3 in. Such a system usually permits the least floor-to-floor dimension, as the depth of the beam haunch will enable the arch level to be well above that obtained in the flat hung ceiling type. If acoustical treatment is a necessity, this can be installed between the beams and either applied on channels or by adhesives. The normal ceiling finish in this instance is the painted concrete.
4. A structural steel beam and girder system with steel floor decking and expanded mica fireproofing.

An examination of the office space survey data probably will disclose that two depths of such space are required. The depth determined upon for the larger laboratories should be examined as providing a number of satisfactory arrangements for desks and chairs such as might be required in the stenographic pools, drafting rooms, library stacks, stock rooms and large group offices. This type of dimensional analysis doubtless will verify the correctness of judgment in selecting the laboratory depth.

In the same manner, the proper depth for the executive offices, one- and two- man offices, and smaller conference rooms is examined. If, in the analysis of the laboratory module, it previously has been determined that two types of laboratory depth are advantageous, depth of the smaller module should be reviewed for suitability to this use. If, as suggested in the discussion of the smaller laboratory module, a depth of as much as 19 ft had been selected, probably it will be found that such a dimension is somewhat excessive for the scientific offices, in which event the alternatives would be to establish a third type of module for office occupancy only, or the reconsideration of the depth of the laboratory, to see if the inconvenience of a smaller laboratory dimension is matched by the wasted area of an 18-ft or 19-ft one-man office.

The proper dimension parallel to the exterior wall of the office module is the only measurement of the typical space not yet fixed. Experience indicates that for a desk and a chair in the large group offices, a satisfactory modular dimension would be approximately 6 ft. Depending somewhat upon the depth, a satisfactory one-scientific-man office can be arranged in a space as little as 8 ft in width, but it is much more convenient in 9 or 10 ft. A width of 12 ft begins to be wasteful. There are big industrial laboratories whose need for group office spaces for design engineers requires such a large proportion of the total area that this arrangement became the determining factor in establishing the width of the module, and yet it was also a very satisfactory dimension for the laboratory, inasmuch as 12, 18, or 24 ft laboratories could be provided. However, the usual requirement represents such a small part of the total that the ideal dimension of such a module is given secondary consideration. For example, in checking the utility of an 18, 27 or 36 ft space for group offices, it would be found that there would be very little wasteful use of space. Accordingly, it is concluded that if laboratories represent the major demand for space, their requirements should dominate the selection of the modular dimensions.



In the text the author makes a strong case for movable partitions of the metal or asbestos cement board types. The other types illustrated at the left, he says, can be made to have most of the required characteristics except that of mobility

Opposite page: safety precautions. At top: laboratory vestibule at Esso research center has safety shower overhead, actuated by chain attached to wall. Bottom photo shows closet for safety devices at same building. First aid and fire fighting equipment and fire safety blanket are located in the cupboards in the corridor between labs

Having determined the dimensions of the module, consideration must now be given to its other parts. The need for windows may have been determined by the client. It has been observed that quite a number of clients at first are inclined to build windowless laboratories to reduce costs and save maintenance. However, it is noted that very few laboratories, even though they may be air conditioned, so that the need for natural ventilation has been removed, are windowless structures. In the event that it is determined to have windows, it is desirable to have the sill slightly above 3 ft in height so that the location of the equipment and, if necessary, laboratory tables along the outside wall is not inhibited. Continuous windows provide some difficulties, as it is frequently found that hanging cabinets or tall apparatus are well situated at the intersection of the exterior wall and subdividing partition. Columns projecting into the room space create pockets for dirt and are unsightly. Desks or laboratory tables are placed in the corners of the room. While the net area is theoretically increased by the difference between normal wall thickness and the projection of the column, its utility is questionable. As a result, there is a tendency to thicken the wall to cover the normal column projection. Even though this increases the window reveal, it is not a disadvantage because this extra furred space may be utilized for running the laboratory services.

If such a method of distribution is adopted, it also solves the problem of radiation. The exterior walls should be provided with convenience outlets for electrical office equipment and clocks. In the event that the building is not air conditioned, the electric fan for the room may be installed conveniently upon the exterior wall.

The lighting of the module can be accomplished satisfactorily by any of the standard methods.

In any cost studies made with respect to the structural system, the problem of supplying laboratory services to island locations should be considered. A practical method is to use several inches of light fill in addition to the 1-in. cement finish and utilize this thickness for the installation of the floor trench with a gasketed cover. Another method frequently used is simply to have a slot in the floor and run the pipes exposed on the ceiling below. This method has the disadvantage of requiring some type of closure to prevent transfer of fire from floor to floor. The danger of spills damaging apparatus on the floor below is present also. If there is a furred ceiling the flexibility is reduced, the appearance is improved, the other disadvantages are relieved, and the lighting is not interfered with. Overhead servicing of an island is unsatisfactory, difficult to keep clean, and still leaves unsolved the problem of handling a gravity drain.

Subdividing partitions should be movable, stable, able to provide means for supporting pipe and shelves, as well as fairly heavy concentrated loads, ability to run BX cables or telephone wires in the base or cornice, one-hour fire protection. They should be as smooth as possible and have a hard, dull, long-lasting and fume-resistant finish. Only metal partitions or asbestos cement board partitions satisfy all of these characteristics. The other partitions illustrated can be made to have most of the properties, except the one of ready mobility. When judged solely on the matter of first

cost, if the alternative partitions meet the requirements, it will be found that metal partitions or asbestos cement board partitions are not materially more expensive than the cheapest, and quite a little less than the tile type. It is difficult to evaluate, in terms of money, several other advantages that these partitions have, such as speed of initial erection, the ability to install floor coverings and lighting fixtures prior to putting up the partitions, the characteristic of dry construction and the lasting qualities of the finishes, which far exceed field applied paint. It has been the experience of one large industrial laboratory that in a five-year period, the number of lineal feet of partition moved was the equivalent to the total lineal feet of partition in the building.

The corridor wall of the laboratory is dependent upon the design of the laboratory service mains and air handling systems. There should be several options as to the location of the door; however, it is usually convenient to have it located on the center line of the module. It should open outward for safety purposes. This is particularly true of the deep laboratories, safety engineers often permitting the shallower laboratories to have inwardly opening doors. The doors should be self-closing, should have a clear glass panel, and there should be no latch on the hardware, it being preferable to use a push plate and a pull.

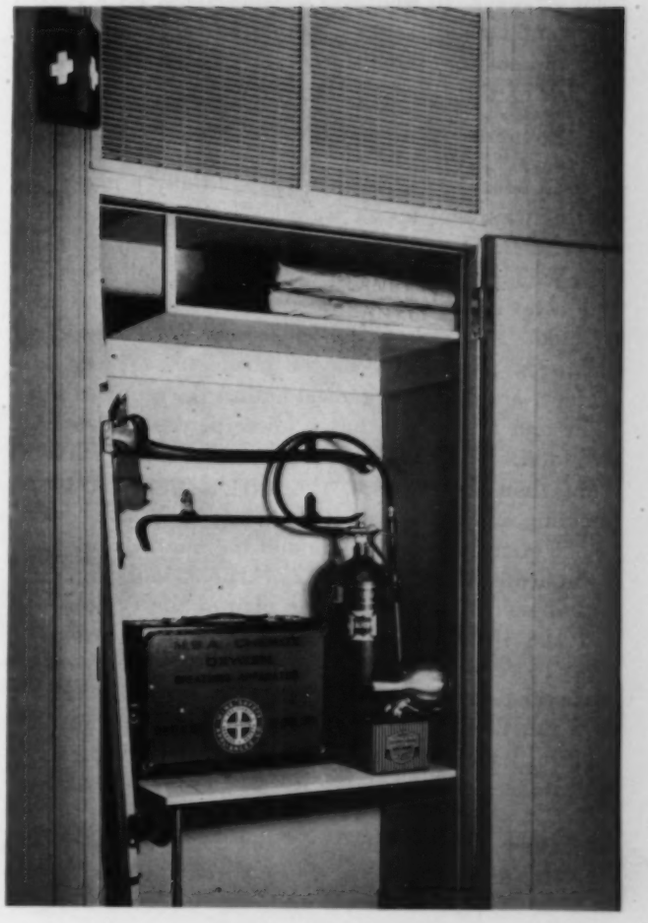
Opening the door outward presents several problems. A corridor either must be made overly wide or an equivalent loss of area must be taken from the laboratory space by providing a vestibule. The vertical service shaft on the corridor wall is capitalized since it automatically provides this vestibule. In chemistry and chemical engineering laboratories, it is very desirable to have safety showers available to every laboratory. They should be in a standard location as it is imperative that a person who is acid-splattered or aflame be able to be helped. The door recess provides a natural for the location of the shower and the safety blanket. The worker should be trained to leave the laboratory in the event of an explosion or fire. As a result, this location for safety appliances is excellent since the man's reflex actions take him to them automatically.

It is preferable to avoid the use of rings for the operation of the shower; instead the end chain should be secured to the wall several inches above the floor. Drains need not be provided for safety showers. These are not only expensive but encourage horseplay. The blanket should be folded and placed in a recess with a glass door. This door should be provided with a tape seal. In this way the blanket is not apt to be stolen. It is easily inspected and readily available. The roll type or the hanging type of blanket are other alternatives but many safety engineers feel that the injured person is almost never able to help himself.

4. *The Planning of the Building*

At this stage in the design process the number and the various types of module, as well as dimensions, have been determined. The nature of the type of

Sigurd Fischer Photos



laboratory, the availability of land, and the desires of the owner, may determine the number of stories.

If the requirements of the laboratory are such as to permit a multi-story building, cost studies will probably show that three or four floors will be more economical than one, two, or more than four. In the event that the laboratory is of the electronics or physics type, in which both the number of services distributed and the number of fume hoods are small, a taller building might be considered for economy.

If it is more than a one-story building, and even then in some cases, elevators will be required. In many cases the items to be moved vertically do not put a severe size or load requirement upon the elevators. As a result, combination passenger and freight cabs are commonly used. A 5 by 8 ft platform, with a 5-ft door on the 8-ft dimension has been found adequate. A porcelain enamel finish will take the severe beating, and still maintain a good appearance.

Nearly all laboratories need large areas for building equipment and the machines that provide the sources of laboratory services. The banks of pipe are both large in size and numerous, and the air handling equipment is bulky.

It is advantageous to locate the fume exhaust system in an attic and the supply air systems in a basement because it is rarely safe or desirable to provide recirculation. It is also desirable to separate the air intake from the exhausts, by as great a distance as possible. Any such arrangement indicates a requirement for a partial basement and a partial attic or fan loft. This is true even of one-story laboratories.

Both of these are relatively inexpensive space, and the need for storage outside of laboratories is great. If storage space is not provided, the laboratories will be used because the scientist is essentially a paper bag putter-away, and aren't we all? Nothing can be more uneconomic than using expensive laboratory area for storage. The additional cost of providing full basement and attic should be considered carefully before it is rejected. The reason that the three- and four-story buildings, particularly in the chemistry type of laboratory, are more economical is that the required basement and attic space has a lower percentage ratio to the total. While this is also true of buildings having more than four stories, the size of the vertical air handling and service shafts tends to become excessive.

The quantity survey data and the requirements having indicated the number of typical floors in the building, it now remains to discuss the plan of the typical floor and the method of determining the quantities and types of various modules, as well as their arrangement. Since the total net area per floor is known, it is necessary to make various layout patterns showing definite arrangements of the several modules. The illustrations indicate sundry solutions to this problem. Analyses will show that the amount of space that will not require laboratory services will vary from 25 to 40 per cent of the total net area. If desk space is provided for technicians in the laboratories, it naturally will be found that a larger percentage of the total space will require the expense of services. While it is true it is not necessary to equip more space than is actually required for laboratory functions with services, a small amount of space not having laboratory functions should be planned to utilize laboratory space initially, such as conference rooms and large group offices, as they may readily be moved to accommodate the growth in the requirement for laboratory space. Thus, if the surveys indicate that 65 per cent of the total area will require laboratory services initially, a minimum of 70 to 75 per cent of the total area should be of the type of module in which services readily may be added.

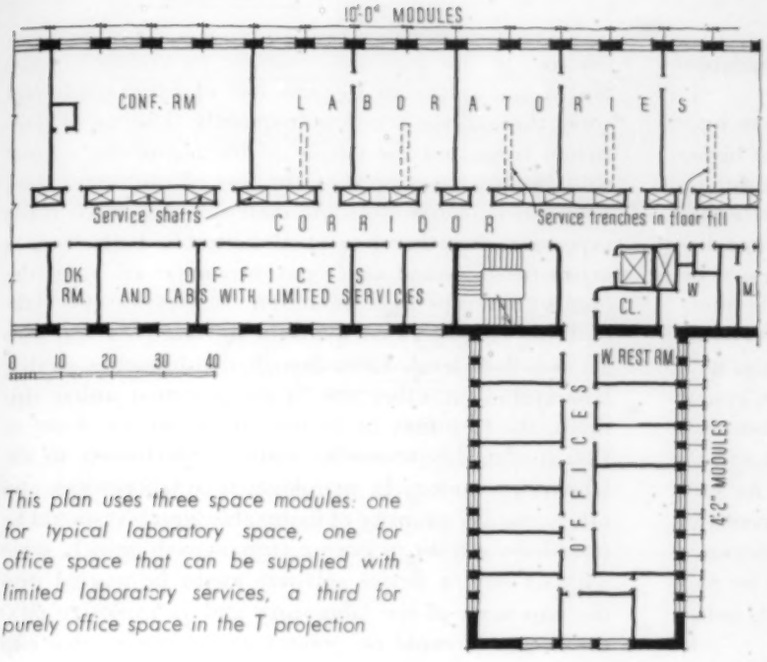
Of the plans indicated, those having three types of module are probably the most economical. Part of this space is not equipped for laboratory use at all, part is equipped to be used with all the laboratory services except hoods and the remainder is fully equipped. Some research laboratories prefer the use of the so-called universal type of space in which only one module is utilized and may be fully equipped with services. This somewhat simplifies the design but usually the space is unnecessarily deep for 15 or 20 per cent of the normal uses. It also means that considerably heavier floor loads than are required are provided for the office functions.

5. *Development of Structural, Mechanical and Electrical Systems*

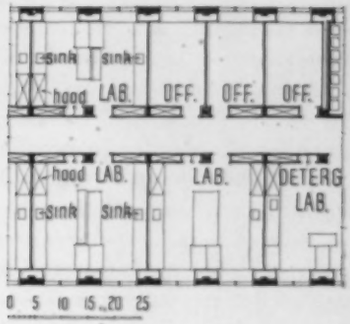
Various systems have been developed to reduce the exterior wall thickness and still retain a reasonable degree of weather and fire protection. One of these is to fabricate the exterior wall columns of car-building bulb angles providing a single column for every module. In this way, the normal 12 in. masonry wall is able to include the structural columns protected by 4 in. of brick on the exterior for weathering purposes and 4 in. on the interior for fire resistance. It is normally economical to provide a multiplicity of exterior columns in order to keep the size of the inward projection to a minimum.

The structural system should not be planned until after the basic system of service distribution is determined. In general, reinforced concrete, while normally more economic than structural steel, does not add to the overall economy. The columns are considerably larger than structural steel columns, and seldom is it possible to make the structural design serve the overall economy of space as well. Since most of the service entrances are near the modular lines, on which it is desirable also to have a beam to receive a partition, some structural economy should be sacrificed to bring about harmony of the whole. Satisfactory interior columns supporting a double girder down the center line of the building have been made of angular shapes repeated in each module. With such an arrangement slots and duct chases may be provided at will and are attended by a minimum of interference to the mechanical and electrical services.

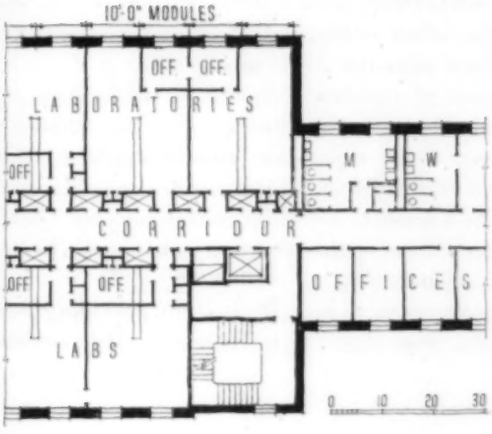
The floor loadings in most laboratory work are not



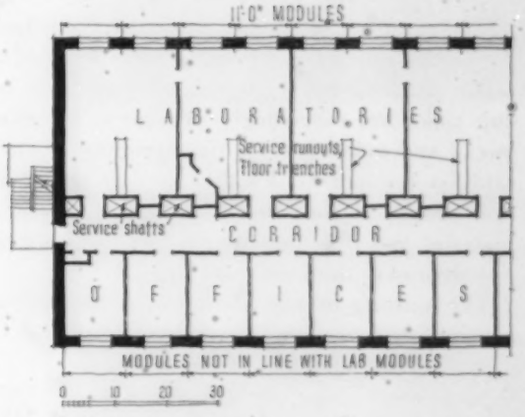
This plan uses three space modules: one for typical laboratory space, one for office space that can be supplied with limited laboratory services, a third for purely office space in the T projection



Standard Oil laboratory (Holabird & Root & Burgee) gets a variety of lab space in 11-ft module. Shallower space marked for office use has service risers, can be equipped with laboratory services



Beacon laboratories (Texas Company) use universal lab space in wider portion with technicians' office space in lab, and a different module for offices in narrow part


11'-0" MODULES
L A B O R A T O R I E S
Service runouts, floor trenches
Service shafts
C O R R I D O R
O F F I C E S
MODULES NOT IN LINE WITH LAB MODULES
0 10 20 30

Humble Oil research building has two different width modules, one for lab space with full services, a smaller one for office space which may have some services

excessive. Usually 150 lb per sq ft is quite satisfactory.

In the matter of fire exits, the provisions of the National Board of Fire Underwriters code, the ASA code, and the usual State Labor Law codes are sufficient except for a few types of exceedingly hazardous research.

If the laboratory is to be provided with a basement, it is the natural thing to locate the mains in this area. The location of the mains of course is dependent upon the location of the risers. If an outside wall system of distribution is selected, the mains are customarily located on each side of the building at the foot of these risers. If a corridor distribution system is selected, the mains are located in the basement corridor.

One of the prime advantages of the location along the corridor is that repairs and additions may be made without interference to the laboratory worker. One of the safety features involved is the ability to turn off the services from the public space in the event of fire. Only a corridor distribution scheme offers such an arrangement. It is also usual that the ventilation ducts are positioned near the corridor, which together with the structural column can be designed into a service center on a modular basis. Such a package usually permits an outward swinging laboratory door without additional loss of space through having the corridor wider than necessary for traffic. The supply air ducts may be distributed either horizontally or vertically without mechanical disadvantage. The exhaust ducts, however, should be vertical, in order to minimize pockets

and horizontal surfaces for the collection of condensation that may be highly corrosive.

A number of two-story laboratories have been built in which the first story has been made somewhat higher than usual in order to provide a furred space for installing the laboratory mains. The service runouts then rise from this bank to the second story or are installed as downcomers from the furred space to the first floor. Inaccessibility and interference with the laboratory technician are the prime disadvantages of this system.

In single-storied structures laboratory buildings have been built quite successfully with an attic main system when no basement has been built. In such systems it is customary to bury the laboratory drains just outside of the building wall with two outlets provided for each module. Such a system probably is to be preferred to a system of floor trenches, even though the laboratory drains are not quite as accessible. These can be supported on the exterior wall by means of brackets before backfilling.

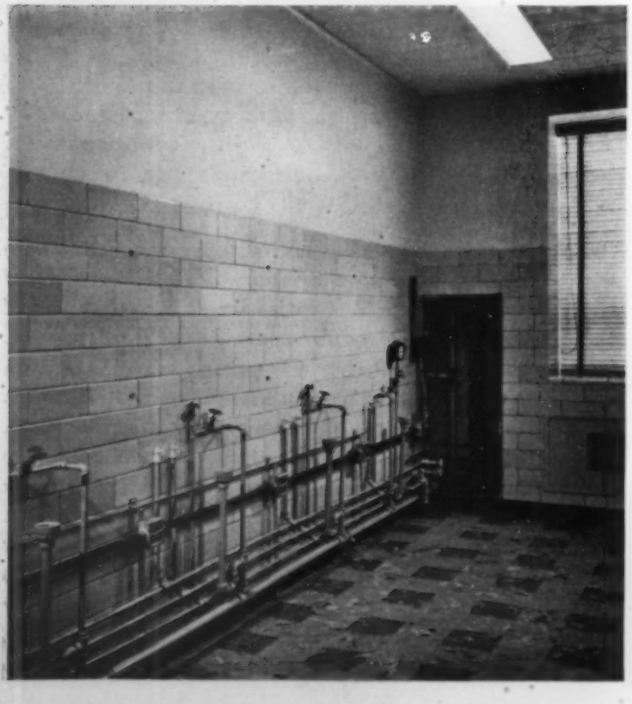
The laboratory drain system should not be tied to a sanitary system for a number of reasons. First, even though a separate treatment may not be required by the local authorities, more and more municipalities are providing ordinances forcing the treatment of industrial waste. In the second place, vent lines from individual cup sinks are exceedingly expensive, inconvenient to install and unnecessary if no connection is made to the sanitary equipment. Finally, the laboratory drain system usually is constructed of expensive non-corrosive material and it is therefore economical to design such a system with minimum size pipe.

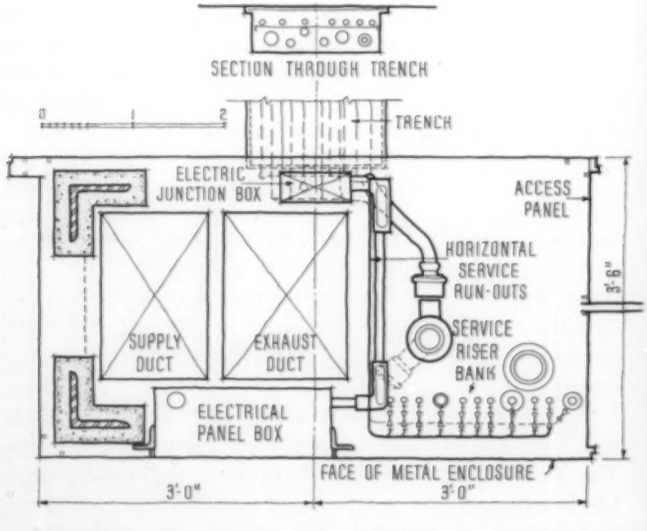
The venting of the laboratory drain system can be accomplished by running each of the stacks through the roof in the normal manner or by connecting the top of the stacks in the fan loft or attic space and going through the roof less frequently. The use of non-siphon traps and the nature of the use of the system will in most cases prevent the loss of protective seal. Traps of corrosive-resistant materials are often quite expensive and therefore it is desirable both from a maintenance standpoint and economy to hold the number of traps to a minimum. In physics type laboratories it may be adequate to provide only one trap at each floor level. Even though two branches serving laboratories on either side of the partition utilize this drain, the trap may be located in the service closet so that it is readily accessible without interference to the laboratory worker. In petroleum type laboratories and others using a quantity of flammable liquids it should be considered a must to have a trap on each branch, since without such a device solvents might be poured into the cup drain of one laboratory and an explosive mixture of gases could be present at the outlet of a cup sink in the adjacent laboratory. Many safety engineers will recommend the use of traps on every outlet, as one laboratory worker may pour a hydro-carbon into a cup sink while the fellow worker within the same laboratory is using a flame near the adjacent cup sink.

Some degree of separation should be made between the water used in the laboratories and the domestic water system. Such separation should apply to the hot and cold water. Most sanitary codes consider any serated tip as a possible source of contamination. There are many conditions in the laboratory that make back-siphonage a probability.

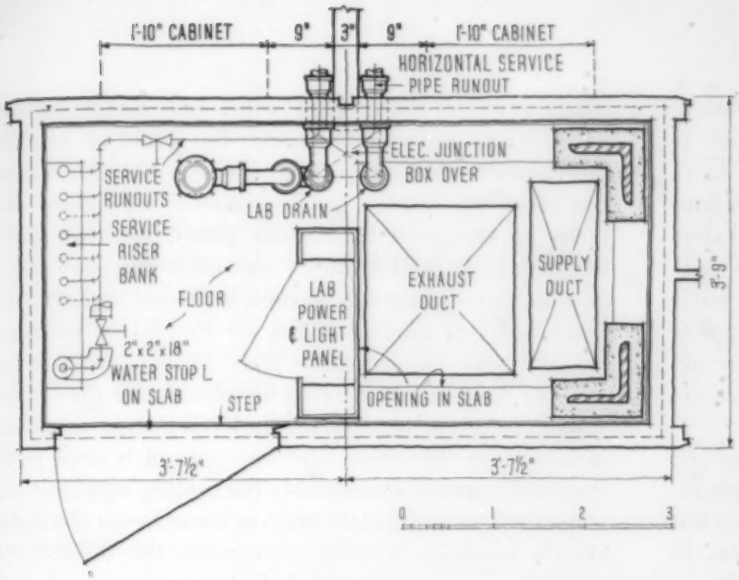
Several methods have been devised for providing this safety feature. Some laboratories have provided vacuum

Hedrich Blessing Photo

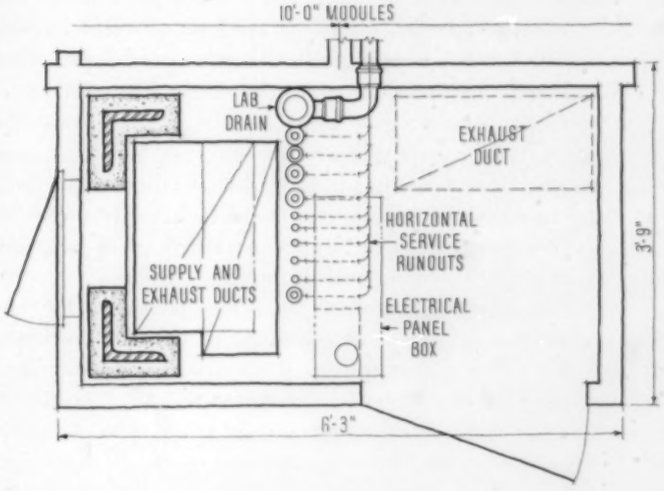




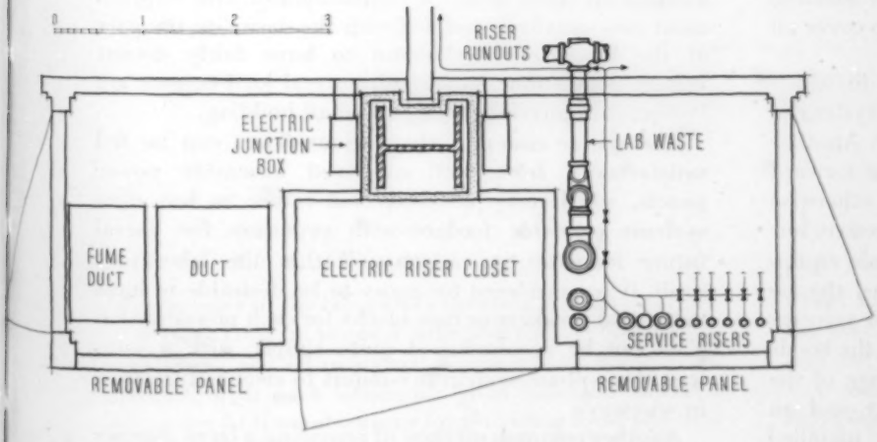
Above: section of service shaft (Esso, Linden, N. J.) shows method of providing services through trench to island bench locations. Left: service lines coming out of shaft (Sinclair, the Austin Co.)



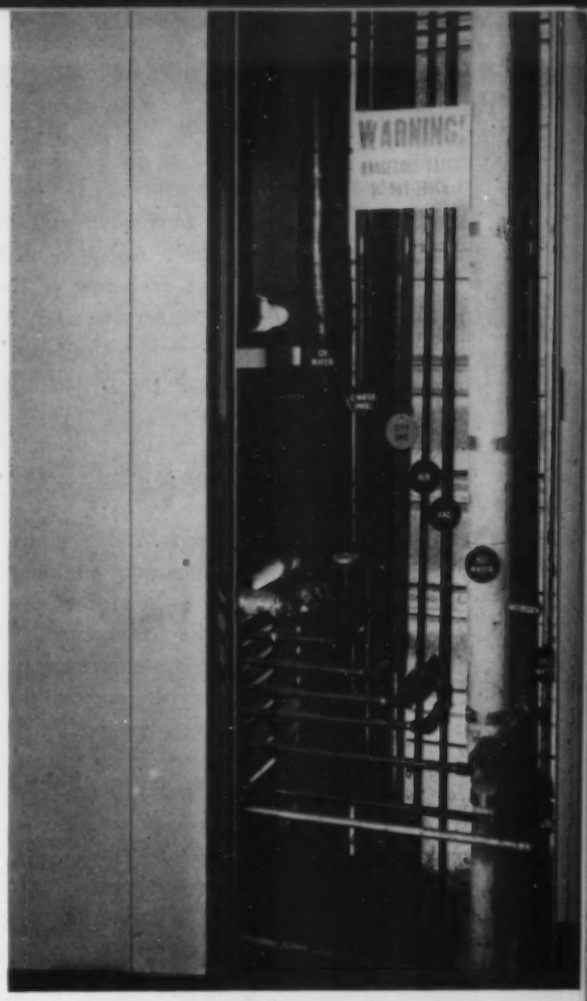
Service shaft shows accessibility of valves for service runouts



Structural angles, off of beam centers, leave best location for pipe risers

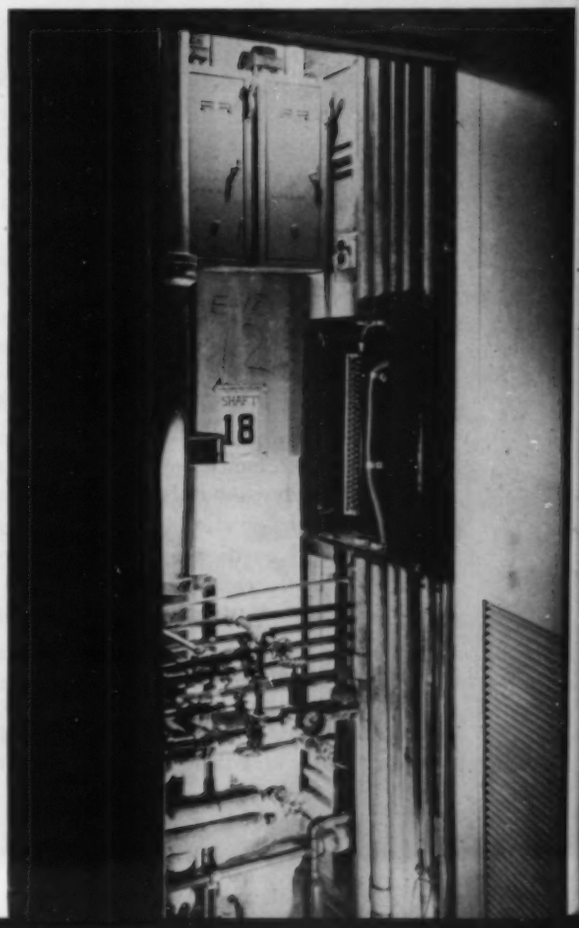


Typical service closet at the General Electric research center is subdivided into duct space for air conditioning, a closet for electric services, and a third compartment for mechanical services



Above: view from corridor of typical riser group at Esso, Linden. Each service is tagged. Below: similar view of shaft at G. E., with telephone and power panels above the pipe lines

Sigurd Fischer Photos



breakers on every laboratory outlet of either hot or cold water. These are expensive and are subject to considerable maintenance. Another alternative is to put vacuum breakers at each one of the connections between the main and the service riser. A third system is to provide double check valves and double gate valves at the point of take-off of the laboratory water system from the domestic water system. Complete separation of the two water systems has been accomplished by means of separate gravity or pressure tanks.

Compressed air systems and various other special services are relatively simple engineering problems. The main consideration to be studied is whether or not it is economically feasible to centrally distribute. In the corridor type distribution system, provision for an entrance to the laboratory at every module is advisable. However, most two- or three-module laboratories require only one door. As such, a very satisfactory location for locally distributed miscellaneous services is provided, which of course is accessible from the public corridor.

Where gases under pressure are generally distributed manifold rooms are usually provided at an exterior wall and are protected from the weather by means of louvers. The gases are stored here as well as manifolded.

More and more laboratories are providing centrally piped distilled water. With aluminum pipe such a system is quite economic, and except for the most rigid research work the quality of the distillate is excellent. Such a distribution system can be used in connection with either stills or demineralizers. At the bench a silver-lined self-closing fitting is customary.

If the laboratory is to be air-conditioned, one of the prime considerations is the quantity of exhaust air. In the last few years, hood design has been studied intensively with a view to reducing the amount of exhaust air without decreasing the safety requirements. Three systems have been utilized with some success. Each must be evaluated with respect to the building being designed, as no comment can be made to cover all conditions.

One is the so-called air-conditioned hood, in which auxiliary air is brought through a secondary system of supply to reduce the quantity of treated air. Another system is to inject air into the hood along the forward edge of the work surface, in order to overcome otherwise lower velocities. Probably one of the most effective, but quite expensive, designs is to install electronic equipment for face velocity control. By this means, the air is reduced proportionately without change in velocity at any change in position of the hood door. As the hoods are in a closed position a very large percentage of the time, very little treated air is thrown away and an almost unlimited number of hoods can be installed before the exhaust requirements exceed the quantities required for conditioning of the building.

Because of the large volumes of air handled, the problem of introducing the air into the laboratory without undue drafts is difficult. Here again the plan which provides office space across the corridor from laboratories serves to simplify the problem of the mechanical engineering. The amount of air required to condition the various types of module is supplied directly to that module. Sizeable grilled areas are provided in both the laboratory and office corridor walls. In this way, the air flow pattern is always through the laboratories as exhaust grilles are located in the laboratory even though there may be no hoods. The corridor then acts as a balancing plenum for the excess supply required by laboratories having large numbers of hoods. In the event that face control is used with the hood exhaust, a constantly fluctuating supply of air is required, as technicians raise or lower hoods throughout the building. In order to overcome this difficulty a variable supply of treated air is fed to the corridor. A pressure operated vortex damper on the supply system will suffice to provide this variable make-up.

The exhaust duct materials may be varied with the type of corrosion expected, from simple galvanized iron to rather expensive stainless steel or asbestos cement board. When a supply and exhaust system is provided, and such a system constantly operates, the dilution of corrosive fumes is so great as almost to negate the necessity for expensive corrosive resistant duct materials. Experience has indicated that laboratories dealing in heavy chemistry can be satisfactorily equipped with galvanized iron ducts provided with asbestos coatings or the simple field applied coatings.

Probably the greatest need for flexibility for any laboratory requirement arises out of the distribution of power. The consumption of electricity has increased greatly in recent years and if the trend continues recently designed buildings can be made obsolete unless the utmost care has been exercised in the allowance for future increases in this important service. While the actual consumption is not great in comparison with that of shops or manufacturing installations the requirement of heavy amperages and wattages at any location on short notice is commonplace. This requirement also usually is coupled with the desire on the part of the laboratory technician to have fairly decent voltage regulation. As a result several load centers are indicated in anything except a small building.

The power risers to the various floors can be fed satisfactorily from well oversized basement power panels, which may be connected either to bus duct systems or cable feeders with provision for liberal future increases in capacity. Within the laboratory itself, it is considered by many to be desirable to have individual breakers or fuse blocks for each power outlet. This can be accomplished quite simply with a four-wire three-phase system in conduit to electric turrets or in wireways.

Another common method of providing a large number of laboratory outlets with somewhat less short-circuit protection is the use of the plug-in strip. Many safety engineers consider it desirable to have the ability to turn off all of the power in a given laboratory from a public corridor. This has been accomplished by having

the main power panels at standardized locations, for example at alternate modules, on the structural columns of the building. Buildings that have utilized the exterior walls as distribution points for laboratory power can be provided with an arrangement to have a trip circuit cut out the breaker with the tripping device located at the entrance of the laboratory.

Finally it should be stated that while the working conditions of the employee are important in every industry, the amenities must not be overlooked if

The coffee hour and the "pause that refreshes" are here to stay. It is quite simple to provide alcoves for dispensing equipment and the congregating area necessary without placing such an appurtenance in the public aisle where the employee becomes afraid that the boss is watching. The rest rooms will not become loafing places merely because they are attractive. Lunch rooms for those who like to bring their own lunch should be provided, and there should be some sort of space at which the employee can eat away from his place of

Hedrich Blessing Photo

For laboratory technicians, the amenities of the building are at least as important as is the plant itself. Photo shows cafeteria wing of Whiting research facilities of Standard Oil Company; Holabird & Root & Burgee, architects

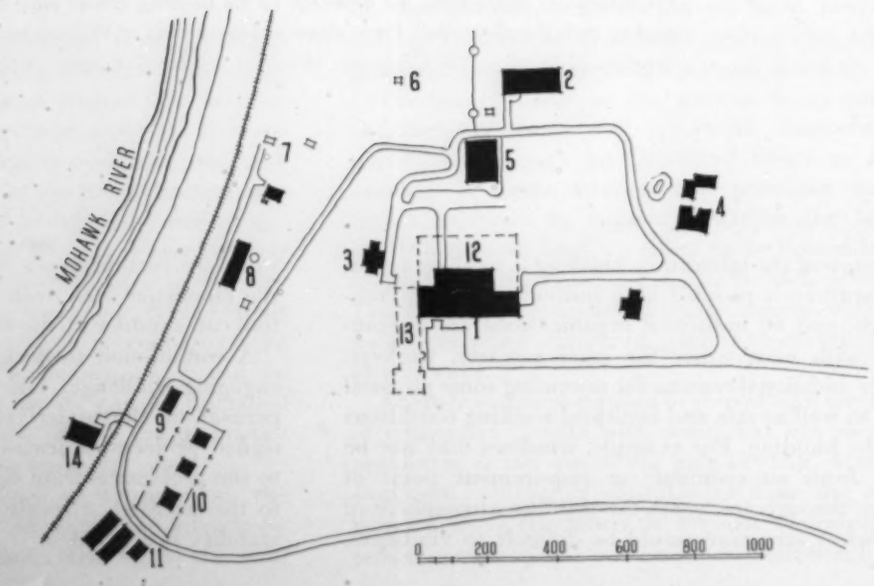
obsolescence of the laboratory building is to be retarded. The laboratory is peopled with individuals doing creative work, and all industrial organizations are in competition with each other for good research workers. These are additional reasons for providing some physical comfort as well as safe and healthful working conditions within the building. For example, windows may not be justified from an economic or requirement point of view, but through the years the cell-like atmosphere of a windowless structure would be difficult to vindicate.

work. In certain types of laboratory research, food in the laboratory can even be dangerous. Research directors can shudder at the thought of a radioactive mouse.

A commission to design a laboratory building is an engaging challenge. The possibilities are endless and a perusal of the underlying philosophy of recently designed projects indicates this variety. If the approach to the problem is from the point of view of convenience to the scientist, a result combining beauty, fitness and stability is assured.

Sigurd Fischer Photos

1 MAIN LABORATORY BLDG
2 SYNCHROTRON BLDG
3 GUEST HOUSE
4 STORAGE BARNS
5 POWER SUBSTATION
6 WATER TOWER
7 SEWAGE DISPOSAL PLANT
8 STEAM PLANT
9 CHEMICAL PILOT PLANT
10 GAS STORAGE
11 QUONSET HUTS
12 SHOP ADDITION
13 NORTH WING ADD'N INCL'D'G AUDITORIUM & CAFETERIA
14 LOW TEMPERATURE LAB.



GENERAL ELECTRIC RESEARCH LABORATORY

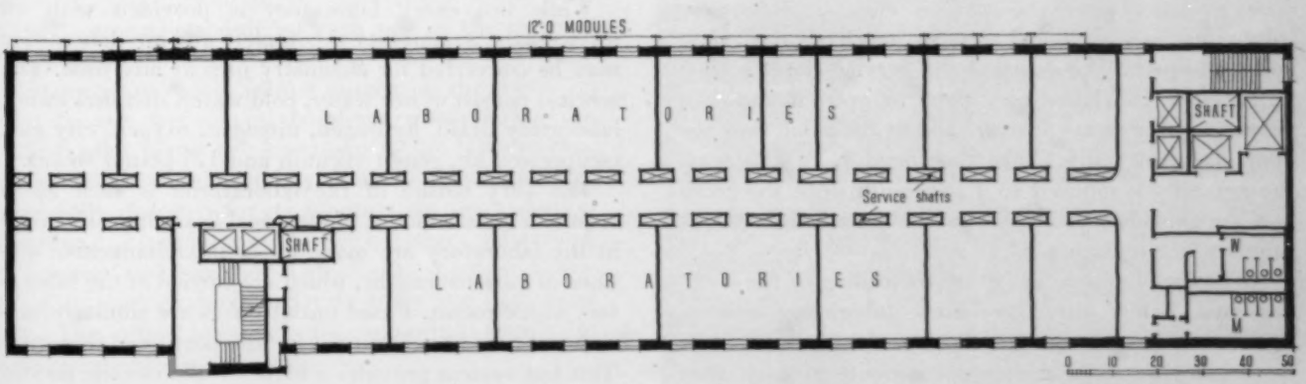
The Knolls, Schenectady, N. Y.

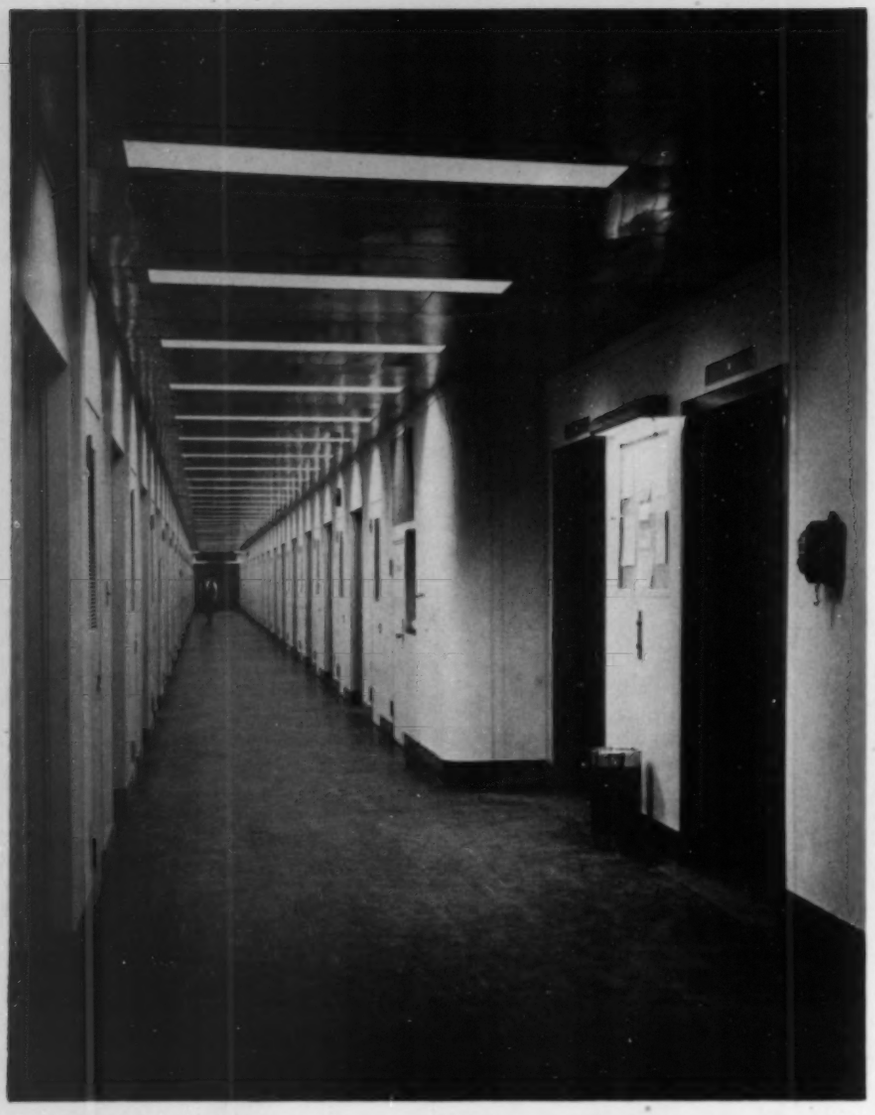
Voorhees, Walker, Foley & Smith, Architects

THE FIRST unit of this, one of the largest industrial laboratories in the country, was completed about two years ago. While there are a number of buildings on the site, the main building consists primarily of electronics laboratories with convenient shops on the first and second floors. Approaching completion is a new wing, which will contain chemistry laboratories.

To take advantage of the rolling character of the site, the building entrance is on what in reality is the third floor. There are two additional floors of research space above the main entrance court. While the two large shop floors are above grade on the easterly side of the building, the floor below the entrance level under the research laboratories is utilized for services and mechanical and electrical building equipment. The relationship of the research space to the shops is admirably suited to General Electric's policy of having the shops as a real service and convenience to the technician.

The size of the module in the research laboratories was selected with great care. It is basically a 12-ft unit, 26 ft in clear depth. The exterior wall has no interior projection, as the radiator enclosures and columns are covered by a single plane of metal wainscot. Diffused fluorescent lighting of low intensity is arranged in strips perpendicular to the windows on 3-ft centers. The 12-in. wide troffers illuminate one-third of the entire ceiling area and the working surface is lighted to approximately 50 foot-candles. The window piers are slightly more than 6 ft in width and are arranged to receive the metal partitions not only at the





Sigurd Fischer Photos

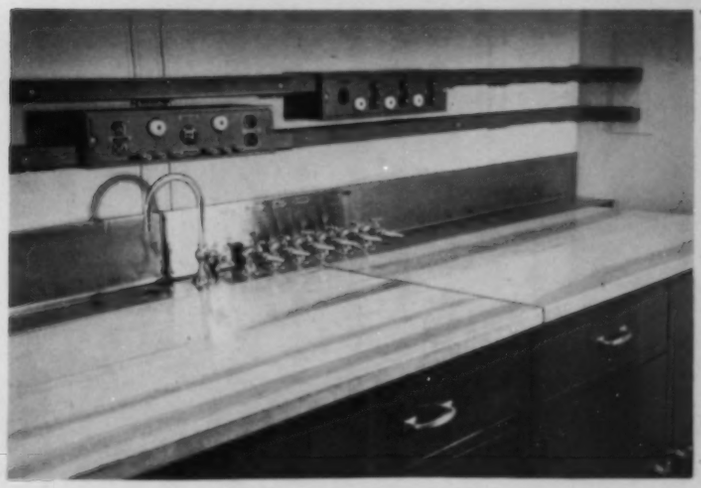
center line, but also at the window jamb. As a consequence, research laboratories may be provided with a width of 9 ft or any larger dimension in 3-ft increments.

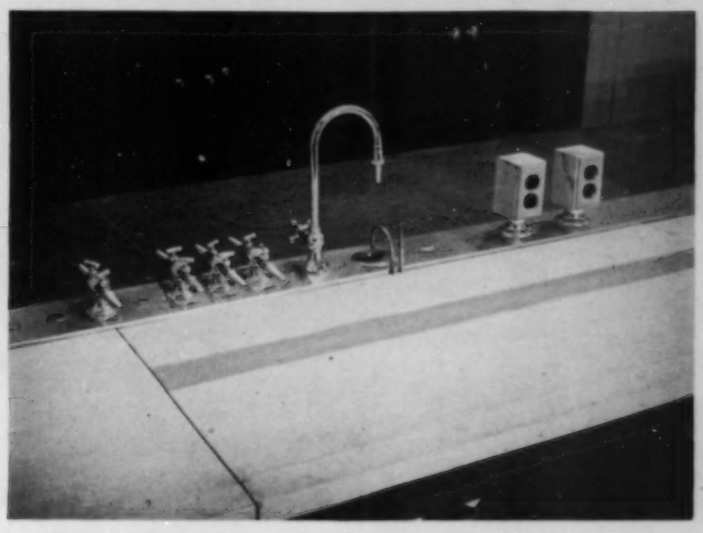
There is a single entrance at every 12-ft module from the corridor. This has been arranged to be subdivided with a 3-ft glazed door and a fixed leaf of approximately 1 ft, which may be opened to allow the passage of relatively large equipment. Between the door entrances are the service closets, which are subdivided into electrical services, mechanical services and duct space. The depth of this service closet is such as to allow the laboratory door to open outward, a very necessary safety feature, and at the same time the door does not project into the corridor. In this way, the net area is reduced to a minimum since the corridors are no wider than they need be to serve their proper function of circulation.

By having the pipe mains on the ceiling of the corridor just below the three-story laboratory section, the risers on each side of the corridor are shortened to a minimum. The horizontal runouts at each floor level are valved so that in the event of an accident within the laboratory, access to the shut-off valves is through the corridor. An attendant advantage to such an arrangement is that risers may be added and additional services provided in any module in the building without interference to any other module, and it is not necessary to involve any of the wet trades in such a procedure.

While not every laboratory is provided with all services, the availability is complete and any laboratory may be converted for chemistry uses at any time. The services consist of hot water, cold water, distilled water, laboratory drain, hydrogen, nitrogen, oxygen, city gas, compressed air, rough vacuum and 125-pound steam.

The very nature of the laboratories is such as to require a great amount of electrical flexibility. The runs in the laboratory are made up of interchangeable sections of various lengths, which are carried in the laboratory stock rooms. Fused outlet boxes are similarly carried and may be substituted for any portion of this strip. This bus system provides a high level of electric service





of from 70 to 100 amperes, which is in excess of that available from conventional conduit systems.

The supply fans are located in the basement. The air is delivered to each corridor in the amount of approximately 8000 cfm each. The corridor doors to the research laboratories are louvered so that the location of the hoods is not dependent upon air supply, as the corridors act as a balancing plenum. Every laboratory has its own exhaust to which a hood is connected if required. The exhaust ducts rise vertically in the service shafts at each module on each side of the corridor to a monitor space located on the roof. In this space the exhaust fans collect from a number of the risers.

On the site are several buildings which house the chemical pilot plant, the low temperature laboratories, and the radiation laboratories. Each of these buildings is especially designed for its function. In the radiation laboratory, experimentation with large betatrons, synchrotons and associated apparatus requires heavy floor slabs, special shielding, wide doors and high head room. The other buildings are somewhat similar in their specialized requirements.

Above: the General Electric laboratory uses the service strip method of bringing service lines to the benches. Upper view shows the splash-back type used against the partition. Lower view shows flat type mounted flush with bench top for island bench locations. Below: laboratory contains extensive shops for use of technicians

RESEARCH GROUP FOR CORN PRODUCTS

Research Laboratory and Pilot Plant for Corn Products Refining Company, Argo, Ill.

Schmidt, Garden & Erikson, Architects-Engineers

For a large food manufacturing industry, research moves through two major cycles; after the original or theoretical study evolves an idea for a new product, a manufacturing technique must be developed and refined. So here are two buildings, the first of an ambitious research project which will eventually include two more buildings. These first two are the Research Laboratory Building and the Pilot Plant. The two yet to come are an engineering building and a chemicals plant to make some special products.

The research laboratory follows the typical pattern of the scientific research building, most of its design problems following in general those discussed earlier in this study. Due to the owners' desire to make this a memorial building, however, it has a distinctly monumental character. It is done in limestone, symbolic sculptures by Lee Laurie flanking the entrance. The vertical fenestration units are of thermal glass in aluminum frames.

Because of the shortage of steel at the time this project was started, it was decided to design a reinforced concrete structure with wall-bearing exterior piers. Mechanical services are brought to the laboratories through these deep piers in the exterior wall. At the corridor columns, the floor slabs have been separated by slots, through which ducts, fume hood exhausts and other services are extended from sub-basement to attic.

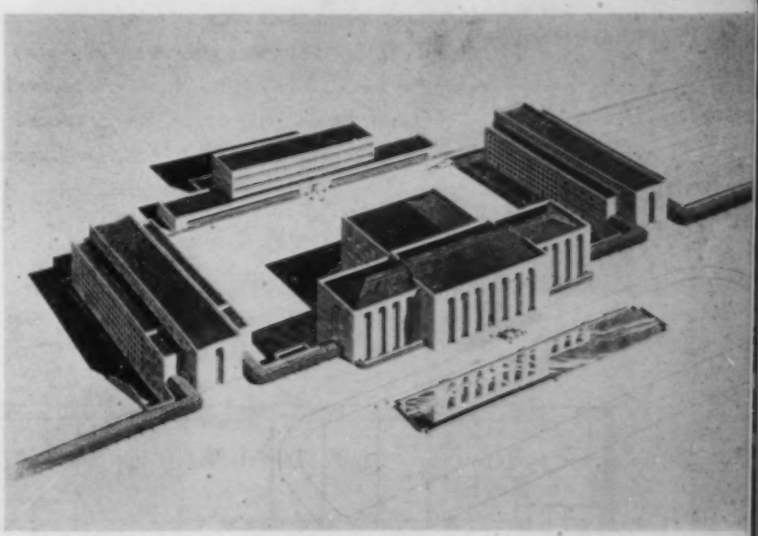
Typical laboratories occupy the second and third floors. The floor plan uses a double corridor scheme (page 130) to solve the usual problem of what to do with the offices for research workers. First floor (not shown) houses lobby, reception room, mail room, offices, cafeteria, kitchen, library and rest rooms. In the basement there are some heavy duty physical laboratories, besides locker rooms, library stacks, toilets and so on. Sub-basement contains a machine shop along with the usual mechanical services and storage areas.

Air conditioning gets especial attention; the plant in the research building has two 300-ton refrigeration units capable of completely air conditioning not only this building, but also the laboratories in the pilot plant and the future engineering building. Both heating and cooling are done through a high-pressure, high-velocity duct system. In addition to the main supply units for the regular ducts, separate fans have been provided for supplying air to certain inside rooms, also supplying conditioned air into the laboratories as make-up for the fume hood exhausts. Humidity control has been provided through the whole building.

All lighting is by recessed fluorescent, fully enclosed fixtures, with continuous strip lighting. Oxygen, distilled water, steam and gas are piped to each laboratory. All electric circuits are provided with individual circuit breakers, at panels so arranged that in case gas mixtures should build up an explosive hazard, the laboratory technician can kill the entire electrical system by pressing a cut-off button at the doorway.

The manufacturing laboratory portion of the pilot plant building is one huge four-story room occupying about three-fourths of the building. The center bay is unobstructed, with a 50-ton crane running the entire length. At either side of this crane bay there are balconies with removable railings and floor grilles, to provide fullest possible flexibility for setting up full-scale model processing plants. Just in case something experimental involves explosion hazards, glass wall panels and the roof slab are designed to blow out without damage to the main structure.

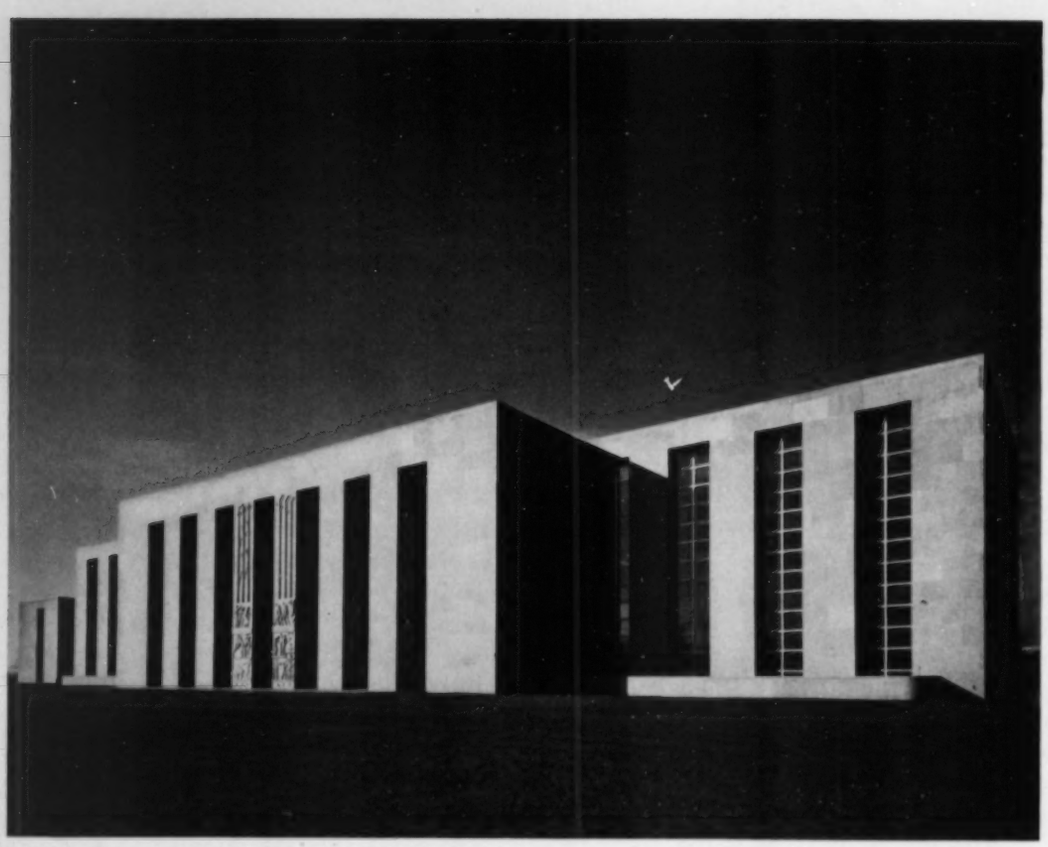
The front section of this building has four floor levels, housing machine shop, locker rooms, mechanical equipment on the first floor, offices and conference room on the second, laboratory and chemical stores on third, fan rooms on fourth.



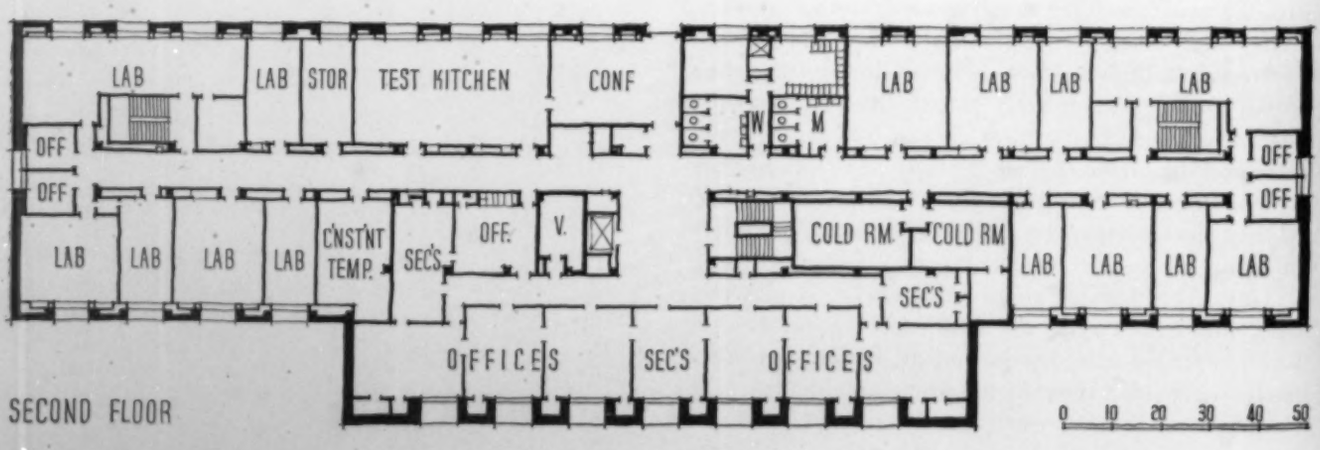
In addition to the research laboratory and pilot plant already completed, the group will eventually include an engineering building and a small plant for manufacturing special chemical products

Torkel Korling Photo

Hedrich-Blessing Photo



What to do about office requirements for the laboratory technicians is always a moot point, some scientists holding out for office space right in the laboratory. But this means more space equipped with special and expensive services. In this building the equipped space is concentrated and the cheaper office space isolated in a double-corridor plan. Interior space is useful for special cold rooms and vaults, and the office space keeps a generally central location with respect to laboratories, toilets and vertical circulation



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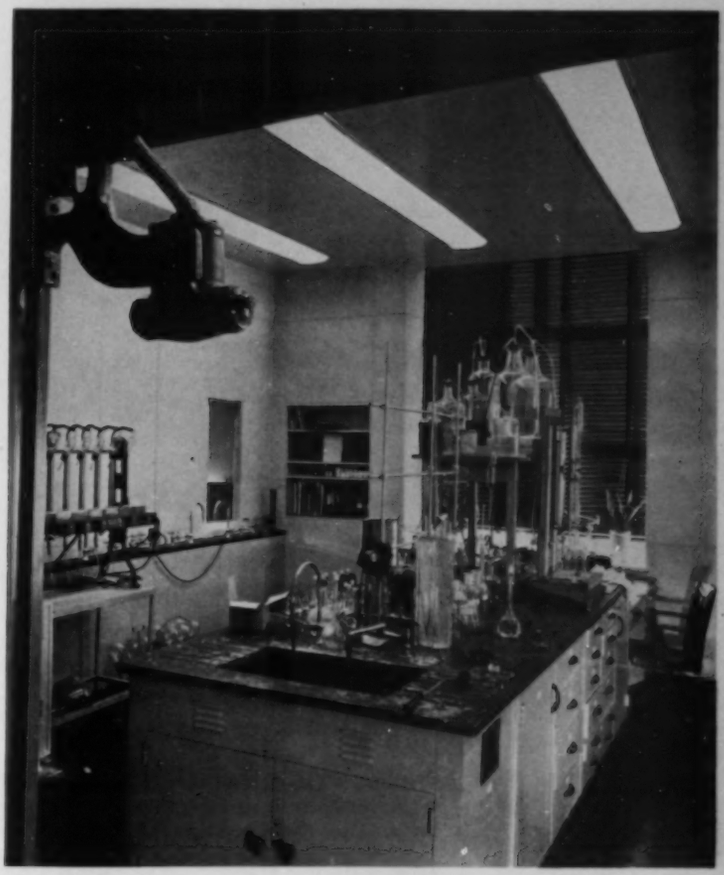


Library, first floor

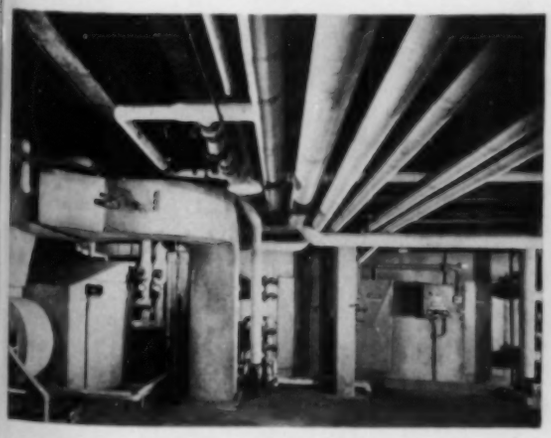
Hedrich-Blessing Photo

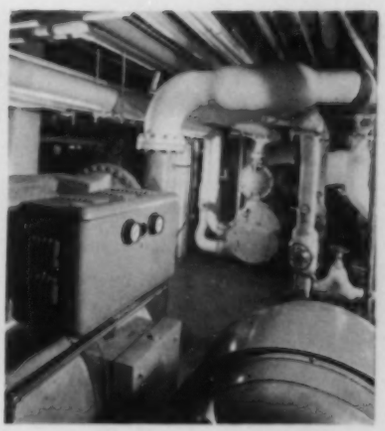
A typical office

Torkel Korling Photos

Air conditioning machinery, sub-basement

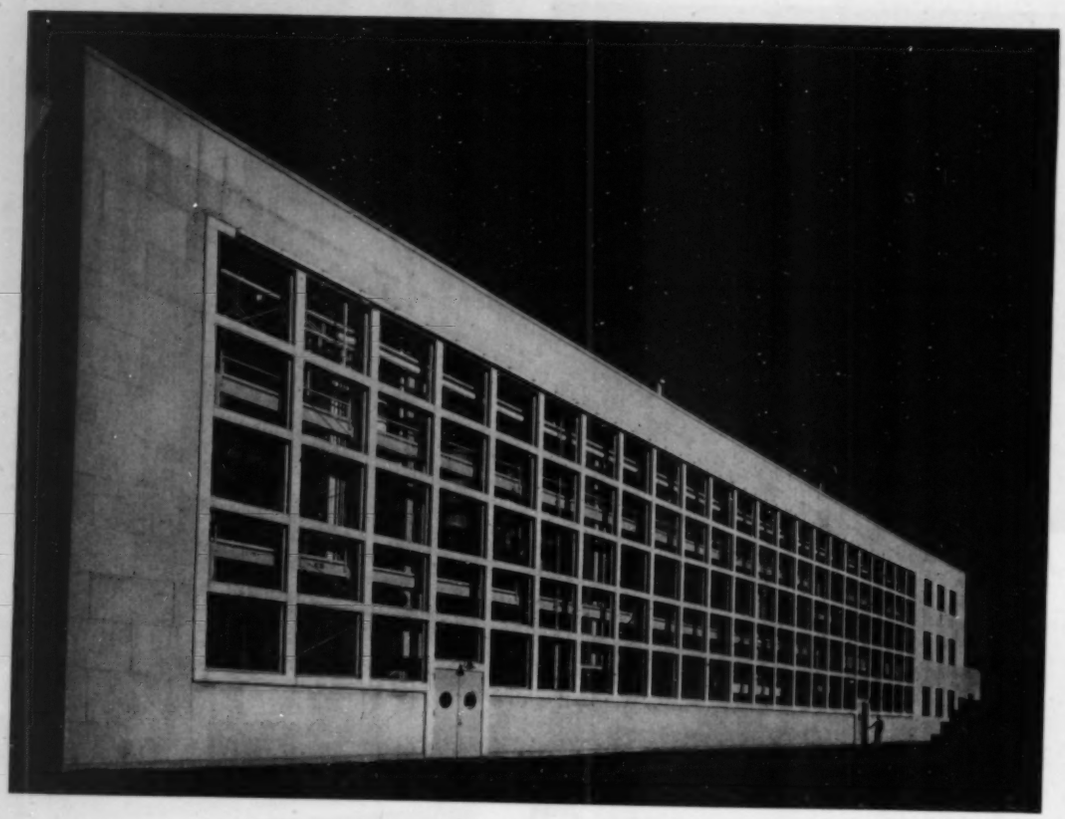
Hedrich-Blessing Photo



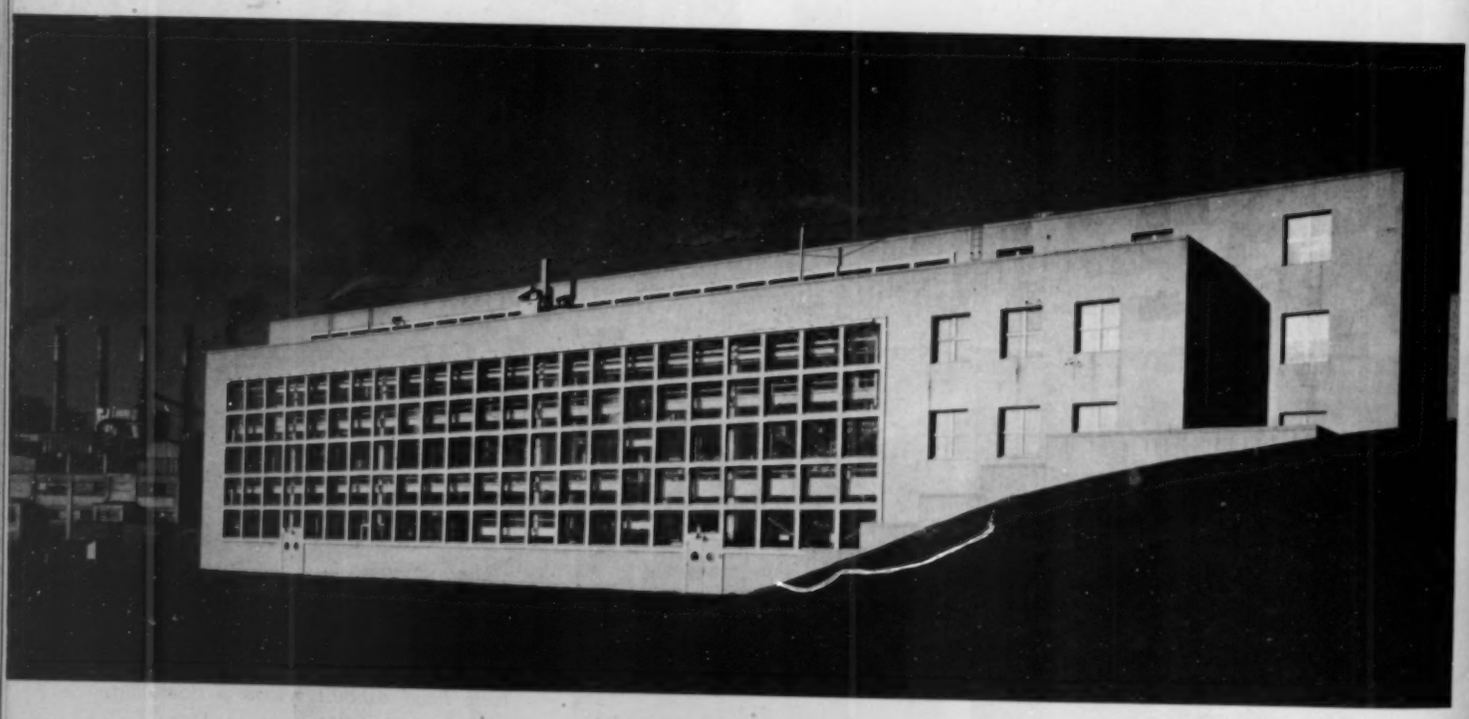


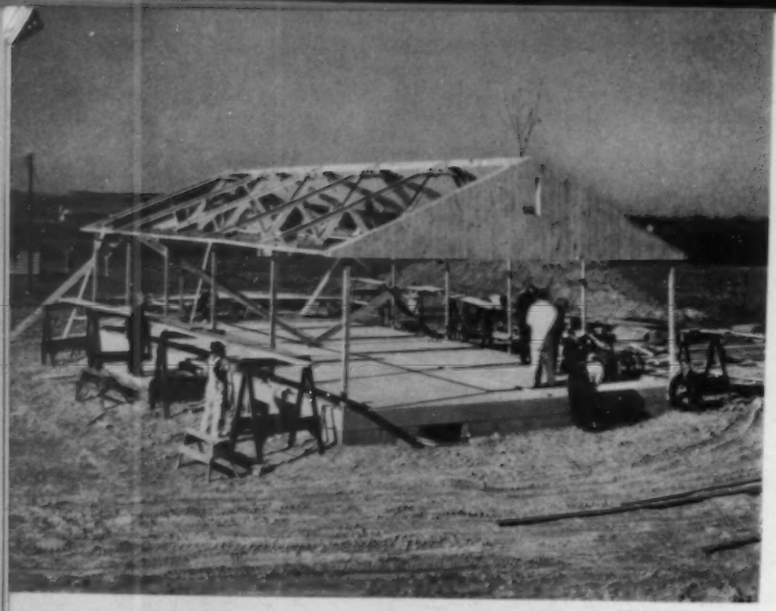
In the laboratories (above) standard equipment includes service strips in panels, fume hoods, metal furniture, partitions of Transite on metal frames. Safety escape hatches are provided, and emergency showers and built-in fire blanket holders. Each fume hood has separate rubber coated fan, electrically interlocked with main fan system; a slight negative pressure is maintained. Interlocked dampers insure that when the fume hood exhaust system is operating, make-up air will be provided

Hedrich-Blessing Photos



Pilot plant building is designed to house full-scale manufacturing equipment for development of techniques. Machinery will be changed or replaced frequently, hence the huge crane bay unobstructed by columns. End portion of building houses laboratories and offices





Photos 4, 5, 6 Pierce Foundation

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Joseph Molitor Photos except where noted

FRAMING AND DETAILS KEY TO EFFICIENCY

Roof goes up first in latest Pierce Foundation prefab house

ONE of the pioneer researchers in prefabricated houses, the John B. Pierce Foundation * has just completed an experimental model at Lebanon, N. J. which follows a long series of similar houses developed over the past ten years, but differs from the others considerably in the structural system used.

Structural System

In this latest house, the framework, a series of bents (trusses fastened to columns) are tipped up into place first, fastened together and to the foundation before the walls are erected. This house thus incorporates the latest thinking in the engineered design of small houses — that a roof, supported by pre-assembled trusses and erected in the early stage of construction can be a major economy. It allows interior work to be done as soon as possible and provides a space uncluttered by bearing walls.

The activities of the Pierce Foundation, a non-profit scientific institution, broadly cover investigations in heating, ventilating, sanitation and the structures into which they are integrated. This includes study of construction methods and all possible materials to make better housing. In their latest house, the architects are studying the efficiency of construction methods rather than trying to test out any new building materials.

The pictures across the page show how much of the house was assembled in one day with a crew of eight carpenters and a foreman; foundation and subfloor were done in five days. Since building this first house, the Pierce Foundation predicts that the next one will take a total of 780 man hours for assembly (exclusive of heating, plumbing and wiring).

Time consumed at the site, considered by itself, may not be startling, if compared with all the prefabs. Some can be site-assembled in a day. But for the degree of prefabrication employed and the inherent flexibility, it represents considerable advancement.

It was amazing to watch how smoothly and efficiently the structural shell went together on the first day. The framing was up in little over half an hour, the roof panels were in place in an hour, individual wall panels took about three minutes to tip into place and be fastened to the columns. What made the whole operation work so well was the new concept applied in the framing system plus many clever details, those evolved from previous studies — for example the ceiling panel assembly — and those developed for the new system — panel to column assembly is one.

House prefabrication, so called, varies from the completely factory-built unit to ones in which the materials are just precut. The Pierce house falls in between the extremes at the point where factory-built sections (wall, roof, ceiling panels and trusses) are easily transported, can be built without a large outlay for space and equipment; and where a small, unskilled crew can handle the site assembly if directed by a reasonably skilled mechanic.

There is complete flexibility in room layout because of the clear span trusses. The length of the house can be varied in 8-ft increments since the bents are spaced at this distance. The truss used in this particular model is built out of double-thick sections of 2 by 4's, as chords, and being spaced on 8-ft centers saves half the lumber used by conventional trusses (2-ft centers).

Although the experimental house is framed of and enclosed by wood, light-gage steel trusses and pipe columns could be used for the bents; other sheet materials besides plywood, and pre-assembled slab or brick panels, if desired, might substitute for the enclosing walls.

Wall panels — with fenestration, doors or a full plywood face — are completely interchangeable.

The house can be built on a slab, over a crawl space or over a basement, as is the case with one illustrated with this article. Although the roof lines and span are fixed by the truss, the basic unit can be adapted to a variety of plan shapes, and can incorporate a garage and breezeway, as done with the house shown here.

Framing

As mentioned, framing consists of semi-rigid bents which can be either wood or steel, erected on 8-ft centers. When steel trusses and pipe columns are used for the bents, nailer pieces must be fastened to them so that the wood panels can be attached.

When tipped up into vertical position, the wooden bents are secured to the sill by means of metal straps (see Fig. 8), are braced diagonally in both horizontal and vertical planes, are tied together and spaced by means of eave and ridge pieces. Eave pieces use metal fasteners; ridge pieces slide into slots in the trusses and are nailed. Gable trusses have the outside covering applied in the field before they are tipped in place.

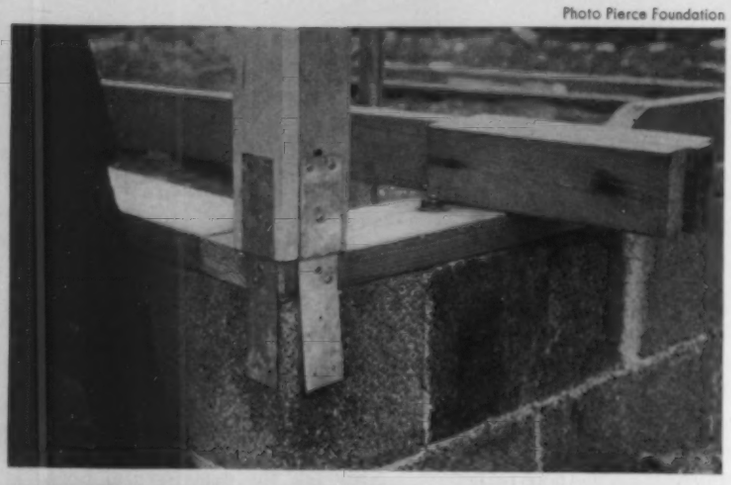
Roof Panels

Roof sheathing panels are nailed to the trusses as soon as the frame is erected, contributing great stiffness to the frame against racking loads. The panels are ½-in. plywood sheets, 4 by 8 ft, except for the ridge panel having a width of 2 ft 5¼ in. They are provided with longitudinal stiffeners in the nature of attached purlins, designed to span the 8-ft distance between bents.

* *General Research Laboratories at Raritan, N. J.*

Structural Shell. *Photos show how much of the newly developed Pierce house went up between 8 a.m. and 3:30 p.m. on the first day.* **1.** *One of the gable bents is tipped into position first; the truss was covered with wood while on the ground.* **2.** *Bents are spaced 8 ft on center; eave and ridge pieces are nailed in place.* **3.** *Roof sheathing panels go on next, nailed only to the trusses; metal tabs along the top edges of the panels tie them together as a unit.* **4.** *Diagonal bracing being nailed in.* **5.** *Ceiling panels supported by beams hanging between bents are installed before the wall panels; one end of the ceiling was finished first so that wall panels could be tipped into place there and the breezeway started. This allowed the laborers to finish the roof at an early stage.* **6.** *The first wall panel being installed.* **7.** *At 3:30 a large portion of the wall panels are in and the first bent for the garage is up*

Photo Pierce Foundation



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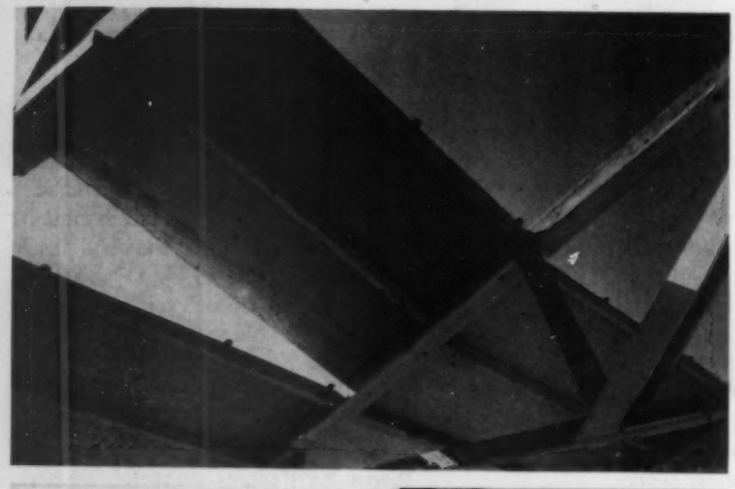

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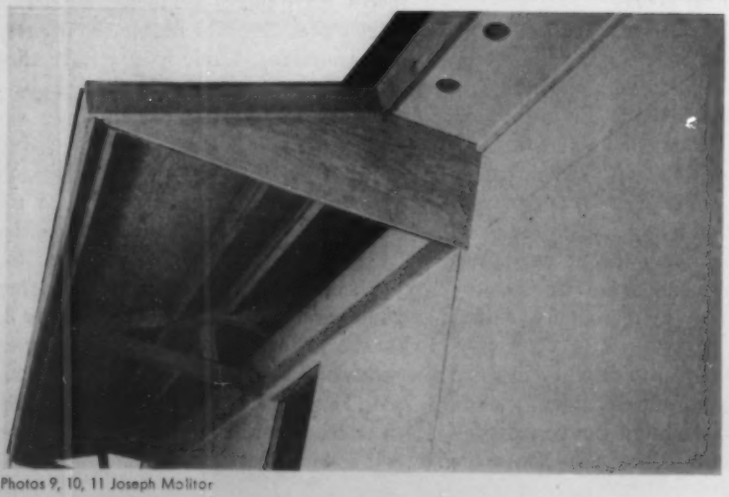

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Photos 9, 10, 11 Joseph Molitor

Plywood Ceiling

Before the exterior wall panels are installed, the ceiling is put up. This unique variation from standard practice provides for more rapid and efficient work in an unrestricted area and lets the edges of the ceiling panels next to the exterior walls extend beyond the inside face of the wall panels. Ceiling panels are all of one standard type, ¼-in. plywood sheets nominally 4 by 8 ft in size, stiffened by nailed and glued cross members on the upper side.

They are supported by engaging special wood beams which span between lower chords of trusses and are suspended in such a way that the entire ceiling can be installed without nailing (see detail next page). After erection, a few finishing nails are driven to hold the panels in proper lateral alignment. Panels are sized, sanded, lightly beveled on their edges, and painted in the shop so that only one field coat is necessary in final decorating. The designers have found that the use of beveled edges for the panels results in a better appearance than if an attempt is made to conceal the joints, since a certain amount of expansion and contraction is bound to take place.

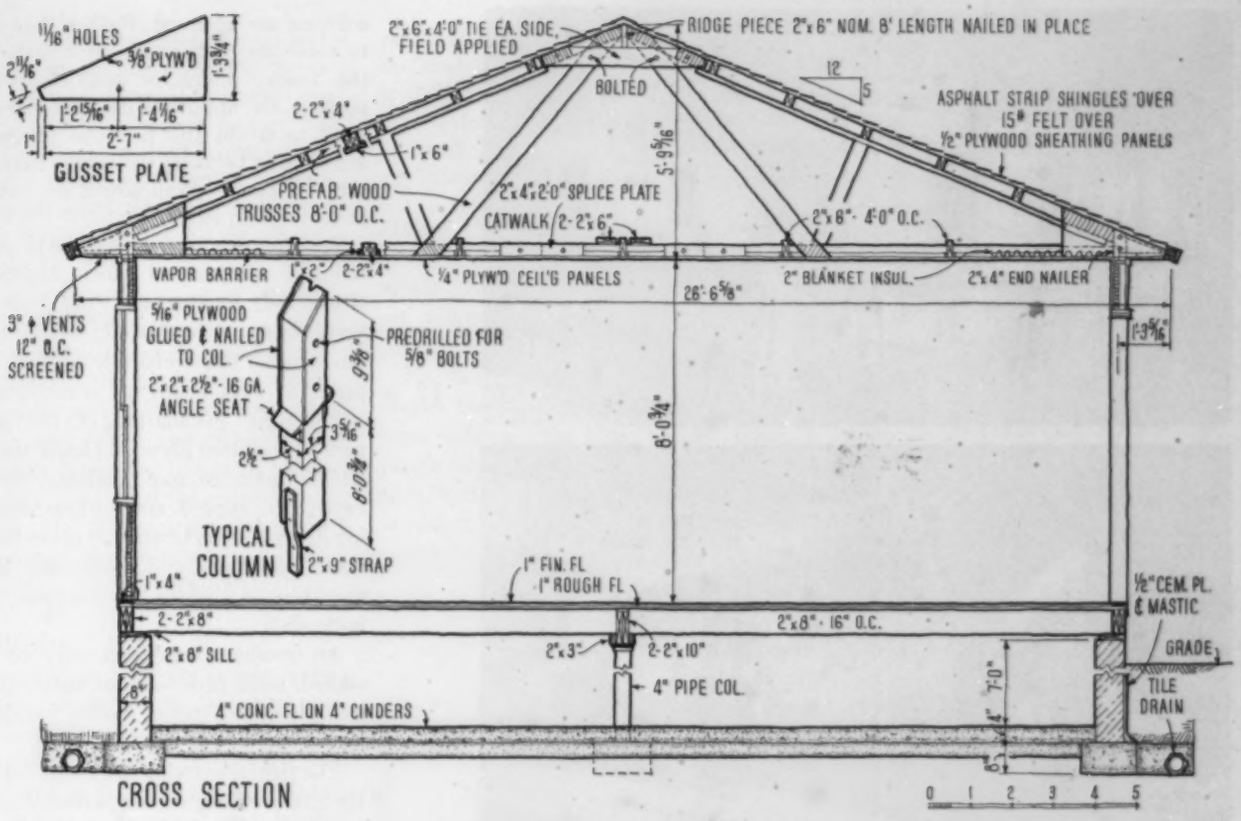
Wall Panels

With the ceiling in place, wall panels, nominally 8 by 8 ft, are tipped up and set between two columns which have mastic applied to them. Machine-driven screws go diagonally through the columns into the framing of the panel, pulling the panel tightly into place against the column and squeezes the mastic between joints of adjacent panels (see detail).

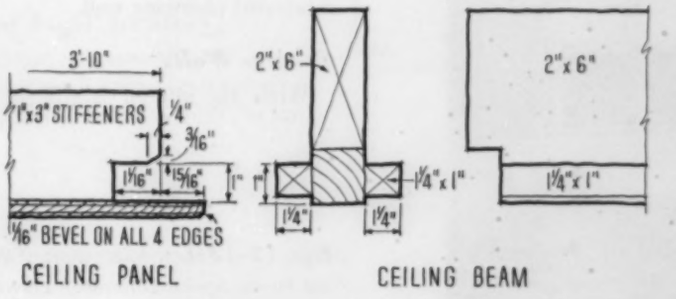
The panels are double-faced, stressskin plywood construction on 3½-in. wood framing, with ⅜-in. exterior grade plywood as the outer skin and a ¼-in. inner skin. Panels are insulated with blanket-type material having one face covered with reflective aluminum foil.

Panels are thick enough so that the

Details. **8.** *Straps tie columns to sill; columns project beyond sill so they will be flush with asbestos cement skirting.* **9.** *Detail shot of the end of the truss.* **10.** *Roof panel stiffeners rest on a ledge formed by piece nailed under top chord; metal tabs tie the panels together.* **11.** *Truss extension pieces and roof panels are added to this house to form an overhang*

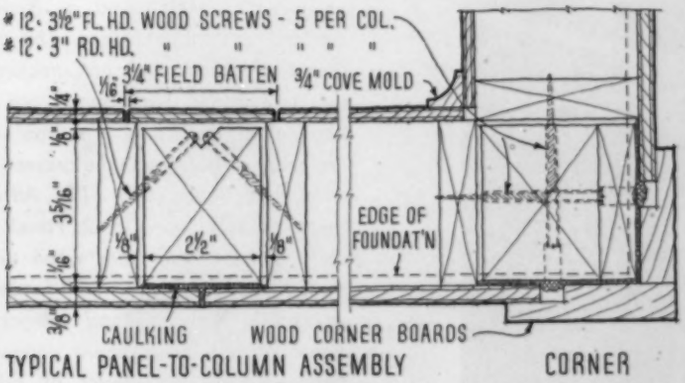


Drawing brings out truss and column details. Cross-hatched areas are both glued and nailed

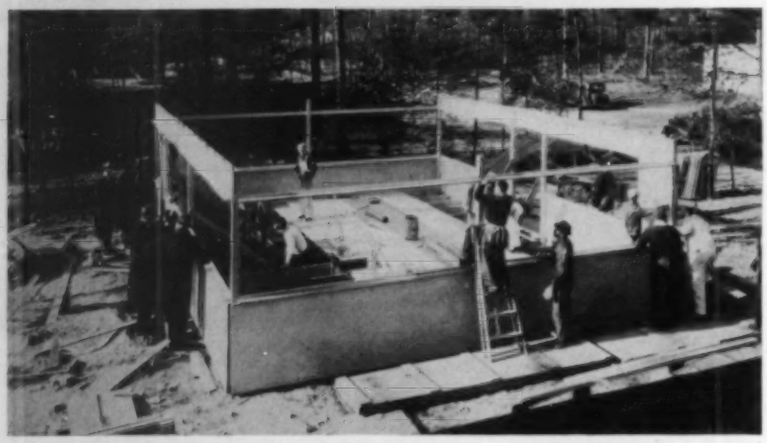


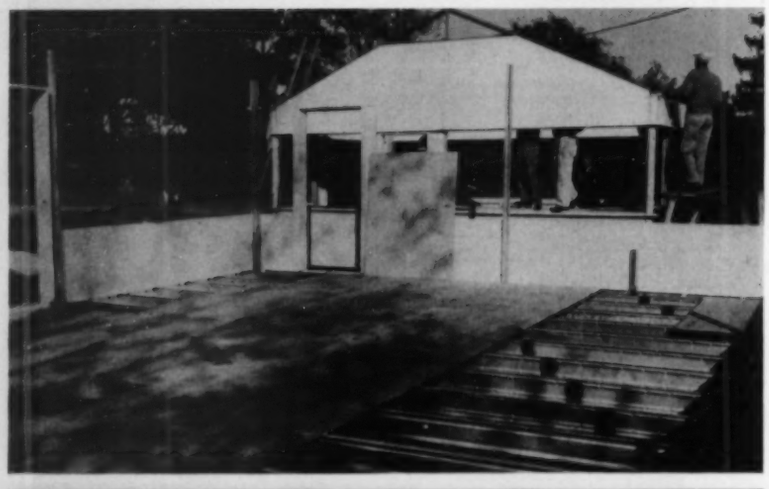
CEILING PANEL ASSEMBLY

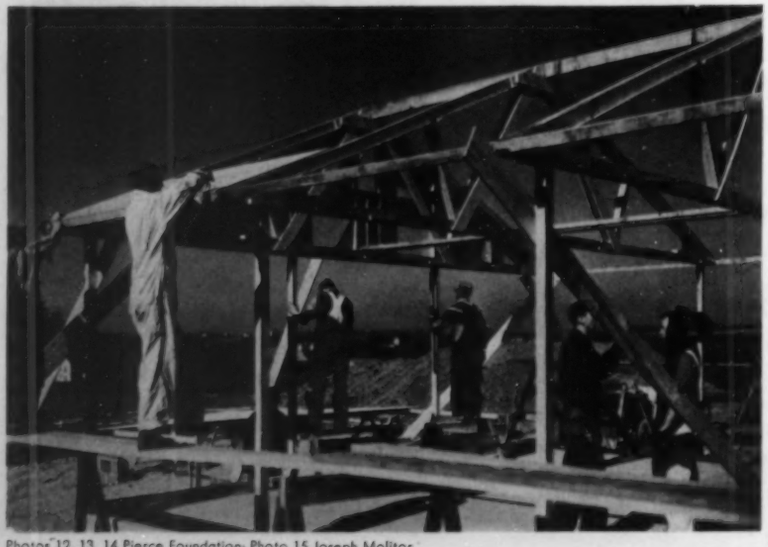
Joseph Molitor Photos


#12 - 3½" FL. HD. WOOD SCREWS - 5 PER COL.
#12 - 3" RD. HD. " " " " "
¾" FIELD BATTEN
¾" COVE MOLD
EDGE OF FOUNDAT'N
CAULKING
WOOD CORNER BOARDS
TYPICAL PANEL-TO-COLUMN ASSEMBLY
CORNER

Ceiling beams, notched at the ends, are supported by ledger strips on the bottom chords of the trusses; stiffeners of the ceiling panels engage strips on the beams. Wall panels are pulled tight to the columns with machine driven screws







Photos 12, 13, 14 Pierce Foundation; Photo 15 Joseph Molitor

columns are enclosed. Rather than try to make the wall panels fit exactly on the inside, which is practically impossible, the architects used filler strips, sized to fit in the field, to bridge a 3¼-in. gap between the inside faces of the wall panels. Wall panels are nailed at the bottom to the sill.

The framing and stressed-skin construction of the wall panels functions structurally by carrying wind loads as vertical beams *horizontally* to the columns rather than vertically between sill plates as in conventional construction.

12

Following installation of the wall panels, pre-fitted plywood panels are installed under the roof overhang, corner battens are applied, and the few remaining items of exterior trim — eaves facia, rake mouldings and horizontal drip moulds — are added to complete the basic shell.

An overhang extension may be installed, using preassembled truss extension pieces and precut roofing panels as shown in Fig. 11.

The panels covering the under side of the roof overhang contain screened vents to insure proper attic ventilation.

13

While the shell enclosure is being completed, plumbing and heating can be installed. Except for large houses, all plumbing is concentrated in one prefabricated plumbing wall.

Storage Walls

While the interior is still one large

Figs. 12–14 *show forerunners of the present Pierce house. Difference between the two systems can be seen by contrasting*

14

these with ***Fig. 15,*** *frame of the new house. In former prefabs horizontal upper and lower wall panels acted as girders to support the roof and floor. The middle course of panels was not structural. In the new model, wall panels are independent of the frame. The roof is the first order of business in the present house instead of walls.* ***Fig. 12.*** *All-wood, Experimental House No. 2. Panels were not faced on both sides when first installed.* ***Fig. 13.*** *Houses built for defense workers in Maryland had exterior wall panels of insulating board sandwiched between protective layers of asbestos cement.* ***Fig. 14.*** *The horizontal structural system was adapted to use of steel*

15

columns, steel and plywood lintel girders, steel floor joists and light steel trusses

undivided space, the finish floor is laid. Packaged storage wall units, which constitute the major part of the partitions and which are also largely factory finished, are then assembled in place.

Interior partitions sufficient to complete space separations are built from pre-cut framing and pre-finished plywood panels.

Electrical Wiring

Wiring installation is made easy through use of wiring chases in storage walls, by the use of hollow partition construction and, in the case of basementless houses, specially designed hollow baseboards, assembled by carpenters in the field. The only cutting of exterior wall panels is at points where convenience outlets are placed near the floor.

Decorating

Decorating is relatively simple. Ceilings, like exterior panels are given one finish coat of paint and interior walls may be either painted or papered. In neither case is it necessary to fill any joints. Where wallpaper is used, heavy felt is applied to the plywood first to prevent cracking of the paper due to dimensional change probable with plywood.

Limits of Field Accuracy

To attempt to manufacture wood parts to very small tolerances, expecting perfect fit in the field assembly, is impractical. In the Pierce house, allowances are made for unpredictable and uncontrollable variations. Enough flexibility is provided in field assembly dimensions and sufficient tolerances are allowed in the fitting of parts.

Other Pierce Houses

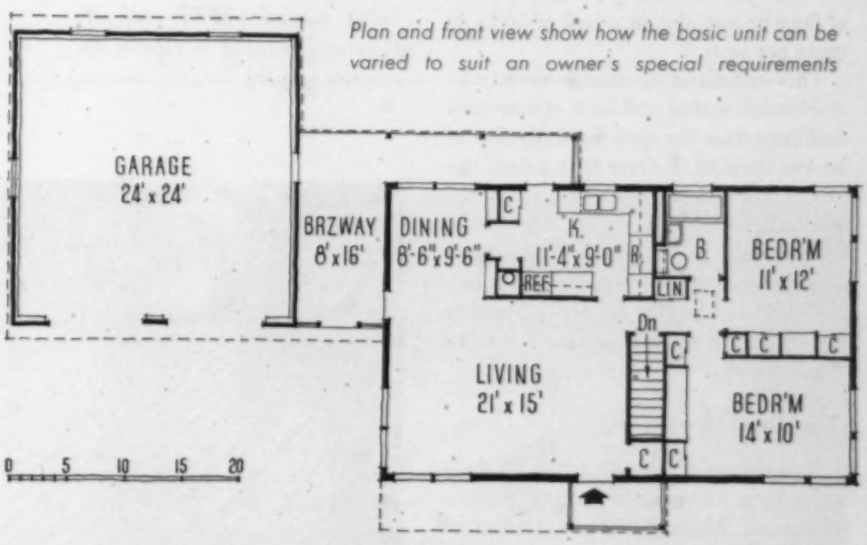
As mentioned at the beginning of this article, the structural system of the latest Pierce house differs considerably from its forerunners.

Emphasis in previous experimental houses has been on a horizontal structural system. (See Figs. 12–14.) Wall panels were erected horizontally in three tiers, each being a complete wall unit, insulated, faced inside and out. Lower course panels acted as deep girders to hold joists and thus support floor loads. Upper course panels acted as lintel girders supporting roof trusses. Middle course panels were non-structural, merely enclosing the space between windows.

Different framing and surfacing materials were tried out. At first wood was used for both.

In several large developments built in 1941, a sandwich with outside layers of asbestos-cement and an insulating board core was used for the exterior walls.

Later on steel was used for columns, floor joists, trusses. Plywood, however remained the wall material in the later models of the horizontal system, and has been carried on into the new house.

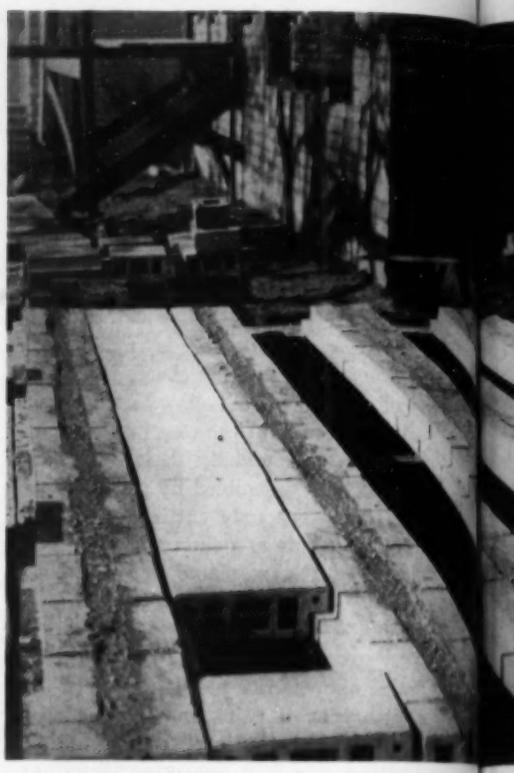


Plan and front view show how the basic unit can be varied to suit an owner's special requirements

Pierce Foundation Photo

TILE-CONCRETE BEAMS FOR FLOORS AND ROOFS IN SMALL BUILDINGS

By J. Neils Thompson, Professor of Civil Engr., Univ. of Texas



1. Precast beams of tile and reinforced concrete have been spaced over supports so that filler tile (note lower right) can be dropped in between. 2. Tile design used in the Joistile system and the two types of construction. 3. Precasting the beams. 4. Beam being placed for floor by hand. 5. Beam being hoisted up for roof. 6. Floor almost ready to receive the concrete topping

3

4

THE LOW COST of floor and roof slabs using the tile-concrete beams shown here coupled with fire-resistance are responsible for their growing application in the Southwest, Iowa and other parts of the Midwest where structural clay tile is being produced in sizable quantities.

A number of contractors in the Southwest are successfully placing this type of floor or roof slab at a cost of 50 to 60 cents per sq ft.

This system is applicable mainly to residential, school and light commercial buildings since the span generally should be less than 20 ft. Over that length the beams become too difficult and costly to handle.

Practically no form work is necessary, and the precast tile-concrete beams can be fabricated readily on the job which accounts for a great deal of the construction economy.

Tile Design

A number of different tile designs have been tried with varying degrees of success. Most of the manufacturers in the Southwest have settled on *Joistile* (See Fig. 2) as providing the qualities essential in a structural unit.

Joistile construction is accomplished with two units of tile which are very similar. One of the units called the beam tile which forms the web of the beam is shown in the top section of Fig. 2. The portion of the tile identified as "A" is knocked out, leaving a trough for pouring in reinforced concrete.

The spanner tile unit which fills in the space between beam sections is very similar in cross section to the one shown except that piece "A" is not scored but left solid. The other diagrams in Fig. 2 show the two types of construction that can be used. The heavy construction has a 2 in. greater effective depth, with corresponding higher load carrying capacity.

Joistile is easy to stock, with very little loss in shipment or handling; only one design is needed for both the beam and the filler tile; and there is little chance of the filler tile breaking during construction and injuring workmen.

Precasting the Beam

The beam tile are laid in line end to end on a firm flat surface until the desired length of beam is obtained. This forms a trough running the length of a row of tile. The proper amount of reinforcing steel is placed in the bottom of the trough. Then it is filled to the top with concrete as is being done in Fig. 3. After curing, in accordance with standard procedures, the beams are then placed on supports, either bearing walls or girders, and properly spaced for the design to be used. Figs. 4 and 5 show the precast beams being placed for a floor slab and for a roof slab respectively.

Filler tile, of the same design as Joistile, without the curfing that forms the knockout piece, is then dropped between the beams (Fig. 1). In the case of spans in excess of 10 ft where deflections during construction might occur, shoring is used at the center of the span. Although the slab is not complete, the strength of the precast section is ample

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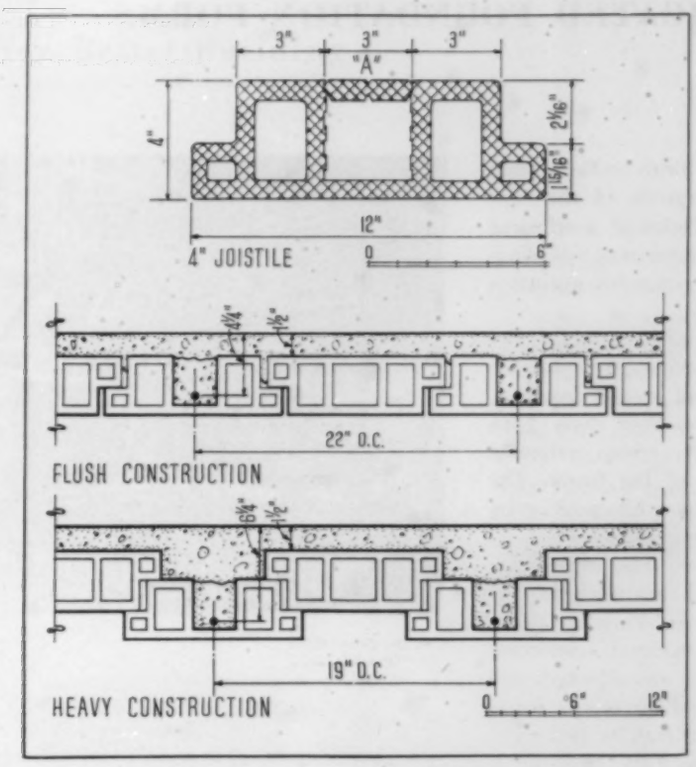

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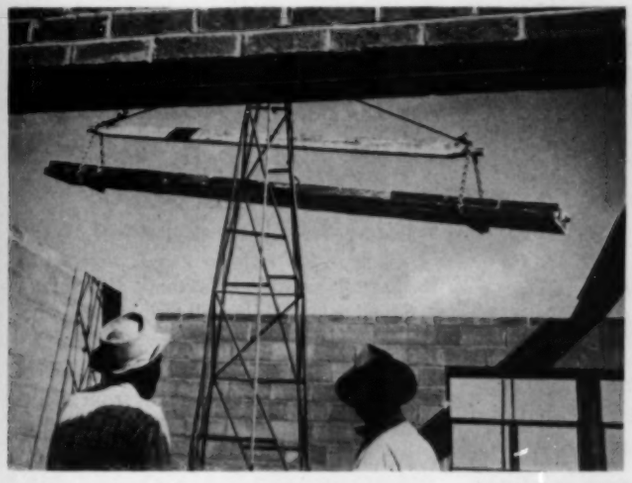

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to carry the construction load. Fig. 6 shows most of the tile in place prior to the pouring of the topping. The bond of the topping to the tile and to the web is sufficient to make this unit act as a conventional T-beam section which is used considerably in reinforced concrete construction.

The final step of placing top reinforcing, if required, piping and electrical conduits is then taken, and a topping of concrete of a depth determined by the design is placed.

Considerable research has been performed by the Bureau of Engineering Research of the University of Texas in cooperation with the Department of Commerce, Clay Products Association of the Southwest, and the Structural Clay Products Institute. A number of structural advantages have been recognized by using the tile which significantly contributes to the structural strength of the beam, particularly in regard to the diagonal tension and in stiffness.

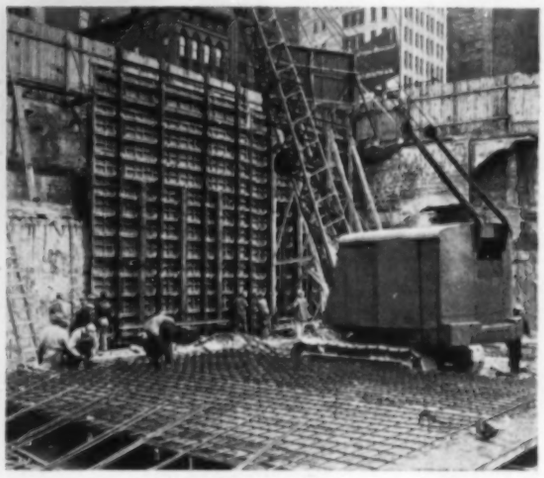
Recent research reports indicate the following conclusions: (1) With this type of tile, and probably with all types, the presence of open vertical joints between tiles is not a source of weakness insofar as diagonal tension is concerned. (2) It is unnecessary to stagger the tile joints on opposite sides of the web. (3) Diagonal tension resistance is increased with high strength tile. (4) Tile reduces the deflection of the joists. (5) Precasting the concrete to the level of the top of the tile does not weaken the bond between the floor slab and the precast concrete if care is taken to use workable mixes and to wet the tile before placing the concrete; but care should be exercised in both these matters to insure good results.

PREFABRICATED FOUNDATION FORMS

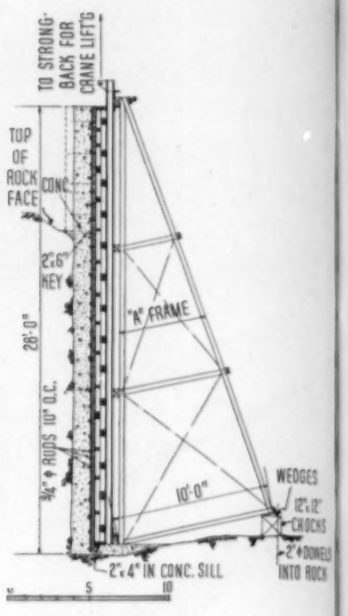
By constructing forms on the ground for the foundation walls of the New York Union Bus Terminal, scaffolding and hoisting of form material was eliminated. Walls were concreted against a vertical rock face.

After the forms were assembled, rigidly welded reinforcing steel was attached by means of special fasteners, developed by Jacob Feld, New York consulting engineer, which extended through the back of the forms. The forms were then moved into position by crane and the concrete placed.

Fasteners released the reinforcing from the forms and they were stripped after the concrete set. Then the forms were placed on the ground, reinforcing for the next section was attached, and the cycle repeated. Four sets of forms were used, each 28 ft high by 24 ft wide. The contractor was Foss, Halloran & Narr, Inc., Long Island City, N. Y.

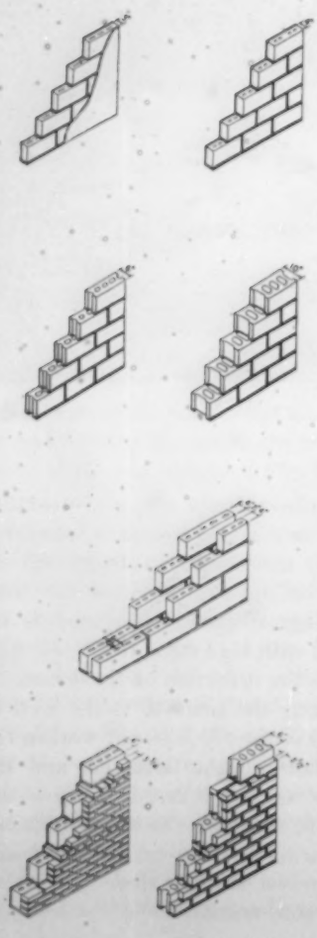


Lone Star Cement Corp.

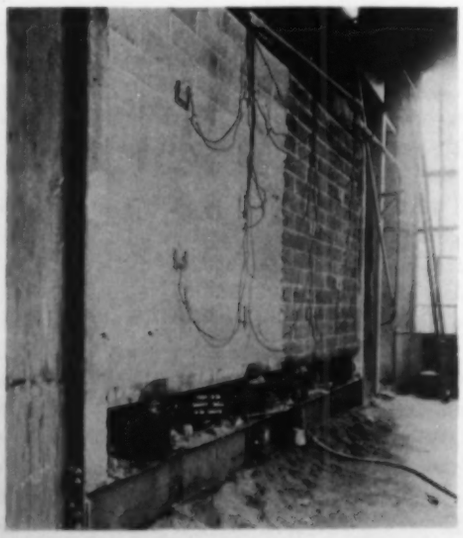


Left: reinforcing being fastened to the forms laid on the ground; the crane hoists them into place next to the vertical rock face. Right: section of the form and foundation wall

FIRE TESTS ON LIGHTWEIGHT MASONRY



Below: cavity-type load bearing walls of expanded slag concrete units (foreground) and cinder concrete (background) set in the frame for fire endurance test. Left: types of walls analyzed in report by the Bureau of Standards



Latest in the National Bureau of Standards Building Materials and Structures Reports * indicates the fire resistance that can be expected of walls of various thicknesses made from lightweight-aggregate masonry units. Aggregates used were cinders, pumice, expanded slag and expanded burned-shale. Constructions tested ranged from 3-in. non-load bearing partitions to 10-in. load-bearing walls with no framed-in members, and included brick-faced exterior bearing walls.

Fire resistance values varied with the thickness of the wall, moisture content at the time of test and kind of aggregate used, and ranged from 69 min for a 4-in. unplastered partition to 7 hr and 3 min for an 8-in. bearing wall faced with brick and backed with 4-in. lightweight units.

* *BMS 117*, **Fire Resistance of Walls of Lightweight Aggregate Concrete Masonry Units, *available from Supt. of Documents, U. S. Gov. Printing Office, Washington 25, D. C. 20 cents.***

PRODUCTS for Better Building

Packaged Heating Units

Small, complete packaged heating units for installation in kitchens or utility rooms were a significant trend evident at the National Oil Heating Exposition held in Philadelphia. The units paralleled in size many of the standard kitchen appliances — counter-height cabinets, refrigerators, home freezers, etc. Most had enamel finishes similar to those used on kitchen equipment. They were designed to provide both heating and domestic hot water supply. Among the models displayed were:

• The *Timken Silent Automatic Kitchen-Type Oil Burner*. A counter-height unit available in two sizes, 35½ by 35½ in., and 26 by 31 in. Both sizes have rounded corners. The larger model may be obtained with a stainless steel work-top. Total heating capacities are 80,000 Btu per hour for the smaller, and 100,000 Btu per hour for the larger unit. Both units may be installed on combustible flooring. The Timken Silent Automatic Div., The Timken-Detroit Axle Co., Jackson, Mich.

• The *GE White-Jacketed Oil Burner*. A refrigerator-sized furnace which measures 52 in. high, 22 in. wide, and 33 in. deep. The gross output is 100,000 Btu per hour. The unit is said to be especially designed for radiant panel heating systems. A small diameter prefabricated chimney may be used with the furnace. General Electric Co., Automatic Heating Div., Bloomfield, N. J.

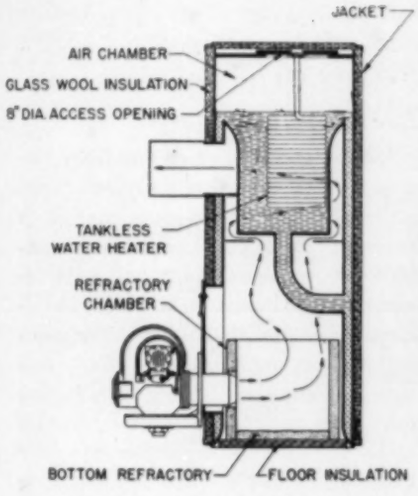
• The *National Packet All-In-One Home Heating Unit*. Designed for steam or hot water heating, this unit is available in two types. One is a round, hot water heater-like unit 21 in. in diam, and 52¾ in. high. It is finished in French gray, with exposed accessories painted black. The other model is housed in a white enamel cabinet with a base 32 by 29⅞ in., and is 56 in. high. Both have an output gross rating of 116,000 Btu per hour. It is said to be equipped with a special type of modulating control system. The National Radiator Co., Johnstown, Pa.

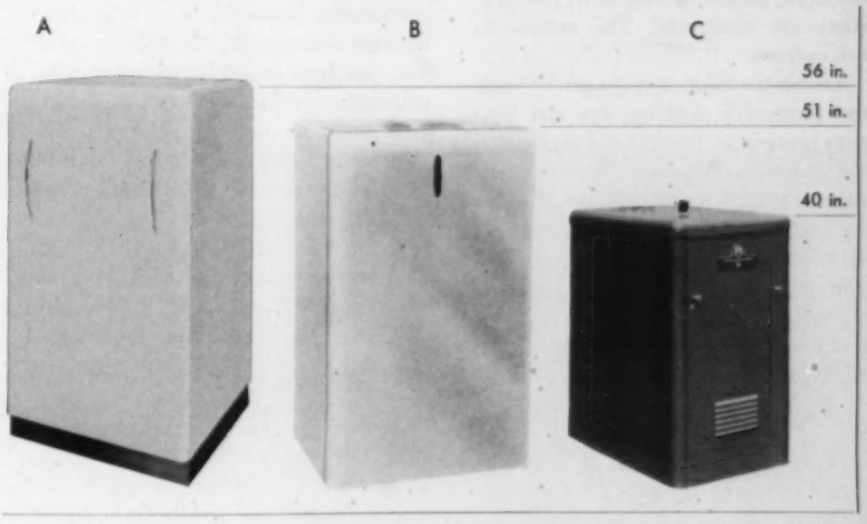
• The *York Heat Levittowner*. This radiant heating boiler is housed in a refrigerator type cabinet, which is 51 in. high, and occupies 5 sq ft of floor space. It was developed for use in the Levittown, Long Island, house development. It furnishes two-temperature water from the same boiler without the use of expensive and complicated mixing valve control arrangements. Low temperature water is supplied for radiant coils, and high temperature for domestic hot water. York-Shipley, Inc., York, Penn.

• The *Fairbanks-Morse Comfort Package*. This unit is housed in a 40 in. high green cabinet. The base is 37 by 24 in. The burner and all operating controls are located behind a front lift-out panel. The furnace is for steam vapor or hot water, and uses oil, gas or coal. The net rating is 77,000 Btu. Flues are of corrosion resistant alloy steel. Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

• The *Bethlehem Crusade-A-Therm*. This unit is principally designed for installation in basement or utility rooms. The

(*Continued on page 192*)





Above, typical new heaters with scale of heights: (A) National Packet units, section and cabinet; (B) York Heat; (C) Fairbanks-Morse. Below, Timken unit in kitchen

MANUFACTURERS' LITERATURE

Safety Equipment

Best's Safety Directory, 1950–1951. This is the third edition of a directory devoted to safety, first aid, hygiene and fire protective products. Each item is presented with a brief description of use and construction, and a list of all manufacturers producing such a product. Many are illustrated. The volume is well indexed.

Among the main sections of the book are: protective clothing; fire and burglary protection; first aid and sanitation; and plant maintenance. Other sections include: above ground protection; warning and material handling equipment; electrical equipment; atmosphere control; and training and working aids. 511 pp., illus. Price. $5.00. Alfred M. Best Co., Inc., Best Building, 75 Fulton St., New York 7, N. Y.

Air Purification Cells

Dorex Activated Carbon Air-Recovery Cells — Type C (Bulletin 117-C). Catalog gives information covering the construction, selection and application of the air purification cells. The functions of the unit are discussed. Specifications, arrangement details, and capacity and resistance curves are included. Illustrations of various types of applications and other types of air recovery cells are given also. 16 pp., illus. W. B. Connor Engineering Corp., 116 E. 32nd St., New York 16, N. Y.

Architectural Metalwork

Hollobilt Aluminum Entrances and Architectural Metalwork. This large brochure covers stock and custom entrances and glass door frames, with many sketches, details and construction drawings. Also included are data on: special windows, standard hardware, custom pull handles and push plates, letters, egg-crate ceiling louvers, shower doors and tub enclosures, poster cases, louvers, jalousies and sun shades. Installation instructions and typical connections are given along with profiles of section members and suggested specifications. 25 pp., illus. The Hollobilt Co., 2081 Laura Ave., Huntington Park, Calif.

Vermiculite Movie Available

A new sound film showing the uses of vermiculite products in construction, entitled *Vermiculite, the Wonder Mineral,* has been issued for use as an educational movie for colleges, short courses, and group meetings of all kinds. The film runs about 18 minutes, and no trade names are used. It can be obtained on loan without charge; the only requirement is a competent operator and standard projection equipment. Vermiculite Institute, Attn. E. R. Murphy, 208 S. LaSalle St., Chicago 4, Ill.

Bronze Memorials

Memorials of Everlasting Bronze (Catalogs O and S). Folders illustrate a line of honor rolls, portrait tablets, nameplates, memorials, architectural letters and historical markers, all executed in bronze. The first folder also includes busts, statues, types of fastenings, and various types of embellishments and borders. 16 pp. each, illus. Meierjohan-Wengler, Metalcraftsmen, 1102 W. 9th St., Cincinnati 3, Ohio.

Kitchen Equipment

Glamour Comes to the Commercial Kitchen. Booklet presents a new line of electric cooking equipment for commercial establishments. Included are: ranges, broilers, fry kettles, griddles, bake ovens, and all-purpose ovens. Descriptions, features and illustrations are given for each of the appliances. A brief resume of the development of electrical cooking is included also. 24 pp., illus. Hotpoint Inc., 5600 W. Taylor St., Chicago 44, Ill.*

Wood Frame Schools

School Buildings Your Tax Dollars Can Afford. Brochure discusses the features of wood frame construction used for one story school buildings. The problem is treated from several viewpoints including: methods used in California, comparative costs, safety factors (fire, earthquake and wind), decay and termites, flexibility, and permanence. Notes are included on modern timber construction, truss designs and connectors. A bibliography of lumber literature also is given. 22 pp., illus. Timber Engineering Co., 1319 18th St., N.W., Washington 6, D. C.

Heat Absorbing Glass

Coolite, Heat Absorbing and Glare Reducing Glass. Catalog describes properties and uses of the glass, and gives notes on its application in new construction, modernization and replacement work in industrial and other buildings. Typical installations in factories and schools are illustrated. Heat and light transmission tables, specification data, and maintenance notes are also included. Catalog and samples of Coolite glass are available when requested on company letterhead. 12 pp., illus. Mississippi Glass Co., 88 Angelica, St. Louis 7, Mo.*

Micarta Panels

YOU Can Install Micarta Panels. Folder describes construction and installation of the factory bonded panels. Pictorial instructions give methods of treating panel edges and tools necessary for installation. Typical construction details for various applications also are included. 4 pp., illus. United States Plywood Corp., Weldwood Building, 55 W. 44th St., New York 18, N. Y.*

Control Devices

Industrial Control Devices For Temperature, Flow, Pressure, Liquid Level and Humidity (Catalog 8303). Presents over 100 different models of non-indicating electric, electronic, and pneumatic controllers for industrial applications. New types of electronic and self-contained electric temperature con-

(Continued on page 212)

** Other product information in Sweet's File, 1950.*

Revere Quality House Proves Economy and Efficiency of KIMSUL*

DONALD H. DRUMMOND
6724 Delmar
Mission, Kansas

January 4, 1950

Kimberly-Clark Corporation
Neenah, Wisconsin

Gentlemen:

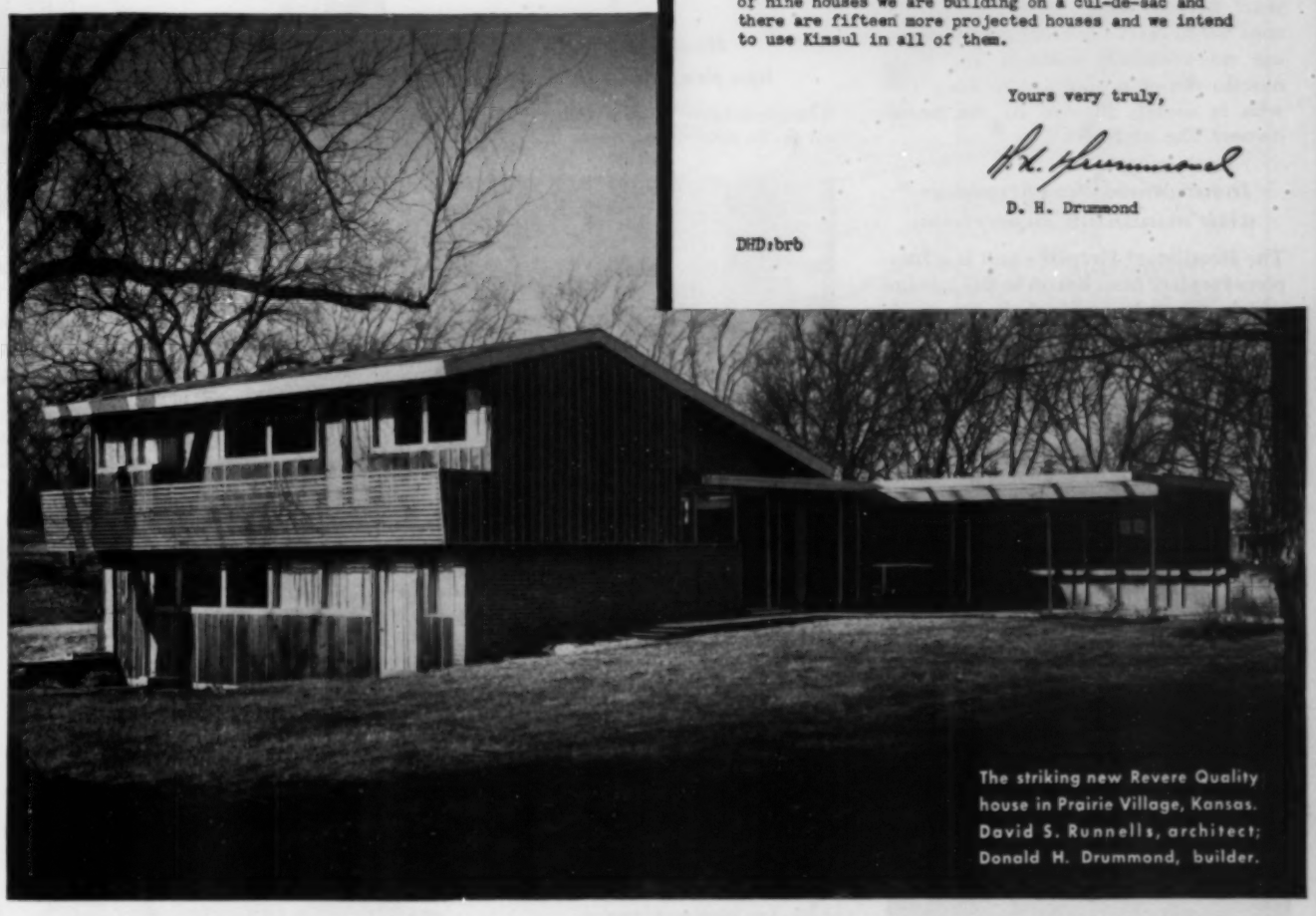
I would like to tell you I have used your Kimsul insulation ever since I started in business. I have found it competitive in price, economical to install, and above everything else a good insulator.

As you know, we used Kimsul insulation in our Model Modern Revere Home here in Prairie Village, Kansas. While our home was under construction there was a good deal of speculation as to whether we could heat a modern house in this climate. The owners have moved in and we have no heating problem. The model house was one of nine houses we are building on a cul-de-sac and there are fifteen more projected houses and we intend to use Kimsul in all of them.

Yours very truly,

D. H. Drummond

DHD:brb



The striking new Revere Quality house in Prairie Village, Kansas. David S. Runnells, architect; Donald H. Drummond, builder.

In today's low to medium-priced homes—where maximum efficiency with *low true cost* is an absolute requirement—more and more designers and builders are specifying KIMSUL* insulation.

The many-layer stitched KIMSUL blanket provides *lifetime* uniform protection over every inch of covered area. Can't sag or settle to leave heat-leaking thin spots. It offers high thermal efficiency ("k" factor 0.27), plus resistance against fire, vermin and mold. In easily handled, *measured* rolls, KIMSUL can be quickly installed by unskilled labor. KIMSUL saves 80% on space and handling costs, too, with each roll compressed to 1/5 installed length. And the exceptional flexibility of the KIMSUL blanket lends itself well to caulking and fitting behind pipes, wiring and other "tight spots".

For complete information, see Sweet's Architectural and Builders Catalogs, or write to:

KIMBERLY-CLARK CORPORATION
Neenah, Wisconsin

Now 2 types of KIMSUL insulation
— Regular and Reflective
(Red Roll) (Gray Roll)

KIMSUL INSULATION
A product of Kimberly Clark

*T. M. REG. U. S. PAT. OFF. & CAN.

Who gets blamed *when a fireplace smokes?*

WHY are thousands of new home-owners caused the expense and disappointment of smoky fireplaces every year? Because many inexperienced masons fail to carry out architects' designs, use rule-of-thumb methods and build hearths out of proportion to flues. But, who is usually blamed by the home-owner? The Architect.

Insure smokeless fireplaces with minimum supervision

The Heatilator* Fireplace unit is a complete fireplace from hearth to flue, around which any style of fireplace can easily be built . . . even by inexperienced masons, and without unnecessary supervision by the architect. The Heatilator unit consists of:

1. *A scientifically designed firebox.*
2. *A properly proportioned throat.*
3. *A removable damper with adjustable poker control.*
4. *An extra wide down-draft shelf.*
5. *Complete metal smoke dome to speed passage of smoke into chimney.*

Typical placement of warm-air grilles in a projecting fireplace.

Because these vital parts are pre-built in one compact form, the Heatilator unit insures a fireplace that draws properly and will not smoke. It eliminates guesswork and other causes of failure.

Costs little, if any, more than ordinary fireplace

Because the Heatilator unit is ready to install, it saves mason time and labor. It saves on expensive firebrick. *Thus, a completed Heatilator Fireplace costs little, if any, more than an ordinary fireplace!* In addition to this original economy, and even more important, your client can count on the *lifetime* economy of smokeless, trouble-free operation.

Heatilator unit ups fireplace efficiency

The Heatilator Fireplace draws in cool air from floor level, heats it, and circulates it to every corner of the room, and to other rooms as well. On cool Spring and Fall days, this use of heat ordinarily wasted makes furnace operation unnecessary. In mild climates, it is the only heating equipment needed. It saves the cost of expensive heating plants that are used only a short time each year.

A Colonial Fireplace built around a Heatilator unit. Warm-air grilles are located in the bookshelf sides.

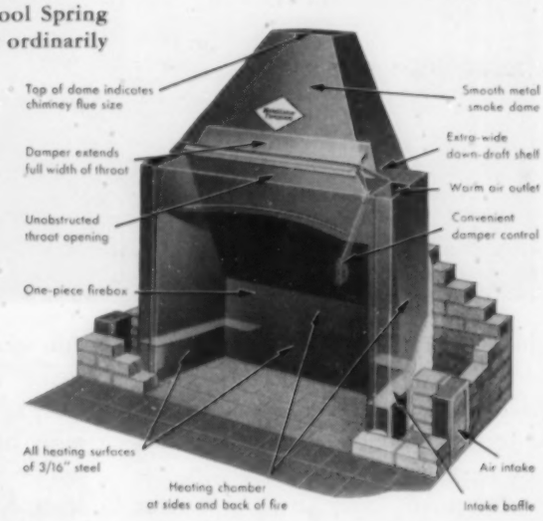
Heatilator Fireplaces are ideal for summer camps and cabins, making them usable weeks longer in Spring and Autumn. It solves the heating problem in basement recreation rooms without unsightly pipes and radiators. Heatilator units, made of boiler plate steel, are built for a lifetime.

A Heatilator Fireplace permits any architectural style and the use of any material. The air intake and outlet grilles are easily placed to blend with the general design. When the fireplace projects into the room, the grilles are out of sight in the ends. If the fireplace is flush, the intakes can be placed in baseboards on either side of the hearth . . . outlets high above mantel.

The warm-air grilles in this striking Colonial fireplace are hidden in cupboards.

Give clients the advantages of a Heatilator unit. Write today for complete information. Heatilator, Inc., 617 E. Brighton Avenue, Syracuse 5, N. Y.

**Heatilator is the reg. trade mark of Heatilator, Inc.*


Top of dome indicates chimney flue size
Smooth metal smoke dome
Damper extends full width of throat
Extra-wide down-draft shelf
Warm air outlet
Unobstructed throat opening
Convenient damper control
One-piece firebox
All heating surfaces of 3/16" steel
Heating chamber at sides and back of fire
Air intake
Intake baffle

HEATILATOR
T.M. REG. U.S. PAT. OFF.
America's Leading
FIREPLACE

HARDWARE—13: Door Holders, Stops and Bumpers

By Seymour Howard, Architect, Instructor at Pratt Institute,
with the cooperation of the American Society of Architectural Hardware Consultants

Note: For specific details and sizes, consult manufacturers' catalogs.

OVERHEAD HOLDERS AND STAYS

General Notes For All Types

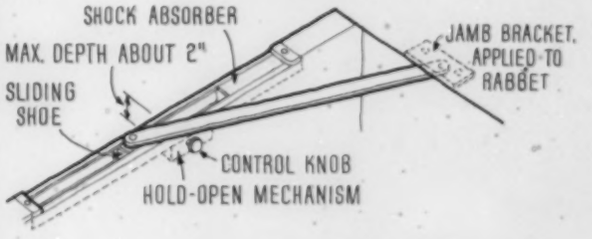
1. In determining hold-open angle, be sure clearance is available for slight swing past angle to allow shock absorber to function.
2. Slide and track types available (concealed or exposed) with friction shoes which hold door open against light drafts at any position (no predetermined hold-open angle).
3. Similar types also available as simple stays (stops), to prevent door opening beyond a fixed angle, but without hold-open mechanism.

Concealed Type

Available for: 1. Single hung on butts;
2. Single hung on offset pivots;
3. Single hung on center pivots;
4. Double hung on center pivots.

Automatically holds door open at predetermined angle (up to about 110 ft); released by simple pull on door.

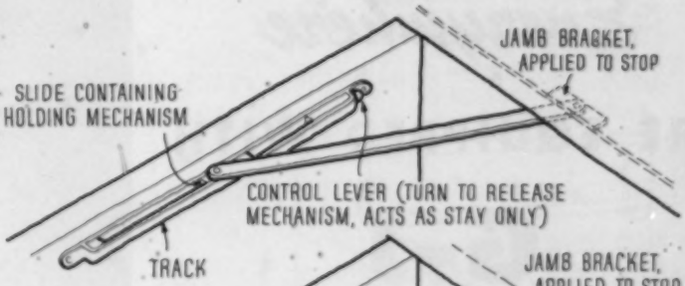
Control knob can be turned to:
1. Release hold open mechanism (acts as stay only);
2. Lock hold open mechanism (door can be shut only by turning knob).

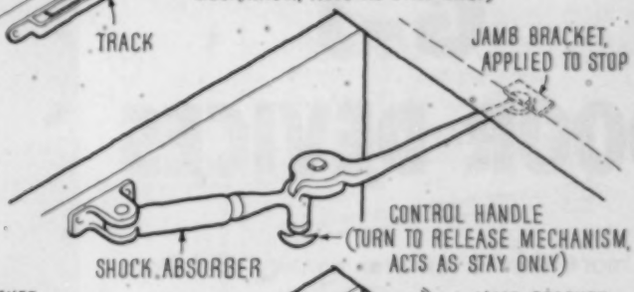


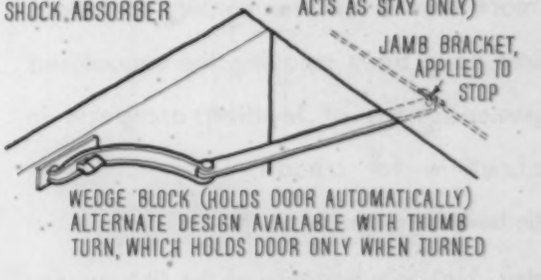
Exposed Types

Available for: 1. Single hung on butts;
2. Single hung on offset pivots;
3. Single hung on center pivots.

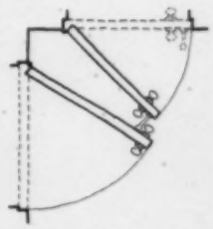
Operation similar to concealed type.

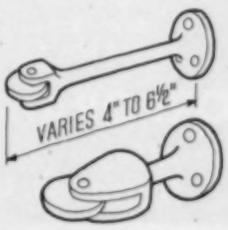

JAMB BRACKET, APPLIED TO STOP
SLIDE CONTAINING HOLDING MECHANISM
CONTROL LEVER (TURN TO RELEASE MECHANISM, ACTS AS STAY ONLY)
TRACK

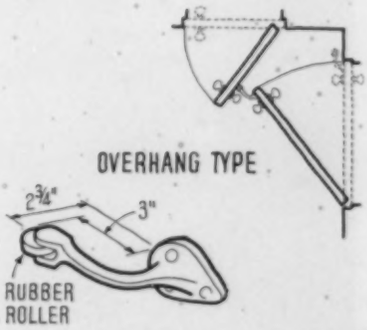



JAMB BRACKET, APPLIED TO STOP
WEDGE BLOCK (HOLDS DOOR AUTOMATICALLY)
ALTERNATE DESIGN AVAILABLE WITH THUMB TURN, WHICH HOLDS DOOR ONLY WHEN TURNED

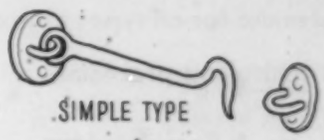
ROLLER STOPS (BUMPERS)







CABIN DOOR HOOKS



LENGTHS USUALLY AVAILABLE
2½", 3", 3½", 4", 6", 8"

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Commercial and Public Buildings

Hospitals

Foremost Buildings Everywhere

ARE EQUIPPED WITH

G-J DOOR DEVICES

For more than a quarter century G-J Door Devices have been enjoying the unqualified recommendations of leading architects in specifications for schools, commercial and public buildings, and hospitals throughout the country. Not only because of the fine quality and unvarying dependability of the products themselves, but also because the G-J line includes devices for all types of doors and their various controlling problems.

- ☆ **A Complete Line**
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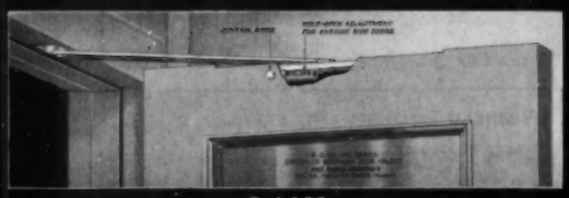
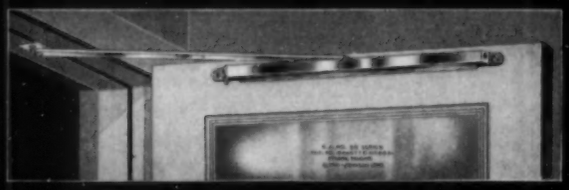
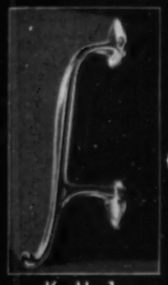


G-J 100
Concealed Overhead Door Holder



G-J 90
Surface Type Overhead Door Holder

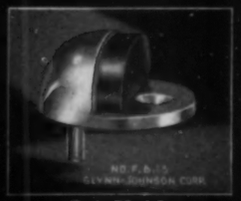


K. H. 1
Arm Pull

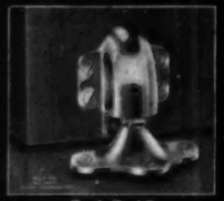
Door Silencers
G-J 64 for Metal Frames
G-J 65 for Wood Frames

G-J 1150
Plunger Type
Door Holder

G-J F-9
Door Holder
and Bumper



G-J FB-13
Dome-Type
Door Bumper



G-J F-40
Door Holder
and Bumper

For complete information on G-J Devices write for general catalog

MERIT CHARACTER CORPORATION DISTINCTION

GLYNN-JOHNSON CORPORATION

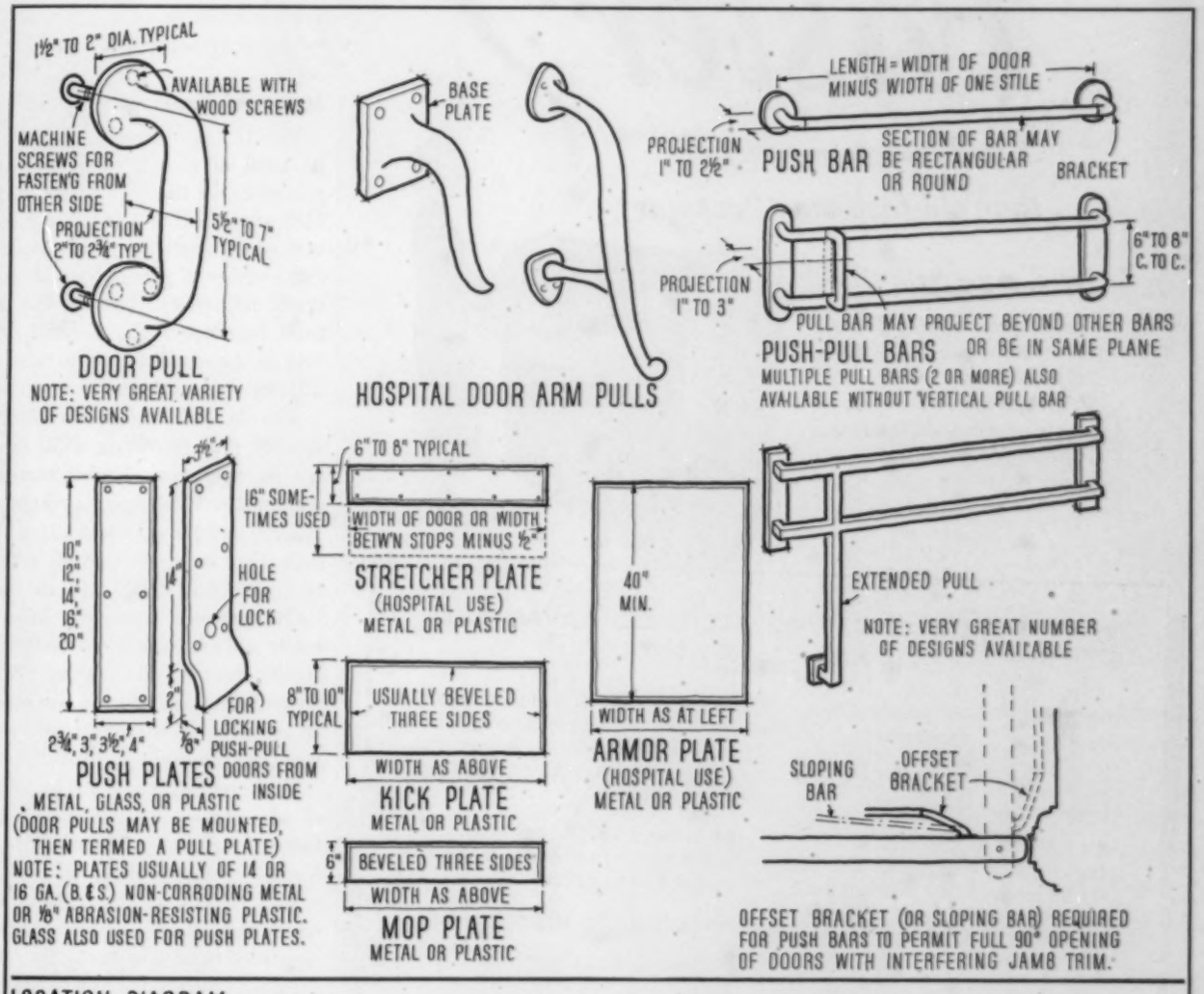
Builders' Hardware Specialties for Over 25 Years

4422 N. Ravenswood Ave., Chicago 40, Illinois

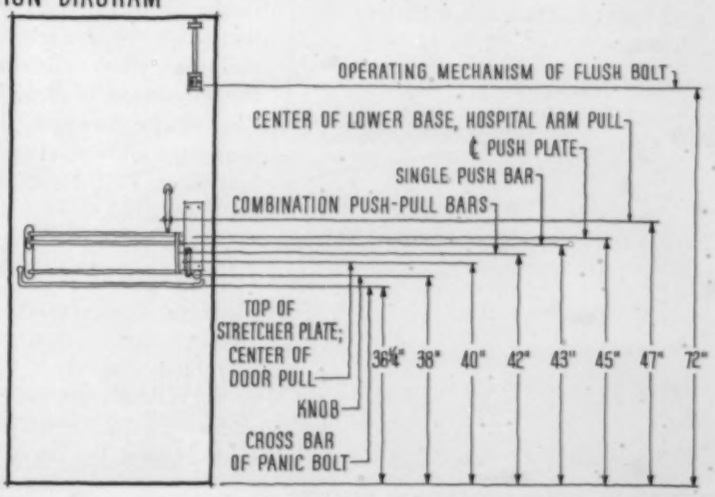
HARDWARE—15: Door Pulls, Push-Pull Bars and Plates, Kick Plates

By Seymour Howard, Architect, Instructor at Pratt Institute,
with the cooperation of the American Society of Architectural Hardware Consultants

Note: For specific details and sizes, consult manufacturers' catalogs.


1½" TO 2" DIA. TYPICAL
AVAILABLE WITH WOOD SCREWS
MACHINE SCREWS FOR FASTENING FROM OTHER SIDE
PROJECTION 2" TO 2¾" TYP'L
5½" TO 7" TYPICAL
DOOR PULL
NOTE: VERY GREAT VARIETY OF DESIGNS AVAILABLE
BASE PLATE
HOSPITAL DOOR ARM PULLS
LENGTH = WIDTH OF DOOR MINUS WIDTH OF ONE STILE
PROJECTION 1" TO 2½"
PUSH BAR
SECTION OF BAR MAY BE RECTANGULAR OR ROUND
BRACKET
6" TO 8" C. TO C.
PROJECTION 1" TO 3"
PULL BAR MAY PROJECT BEYOND OTHER BARS OR BE IN SAME PLANE
PUSH-PULL BARS
MULTIPLE PULL BARS (2 OR MORE) ALSO AVAILABLE WITHOUT VERTICAL PULL BAR
10", 12", 14", 16", 20"
14"
HOLE FOR LOCK
2" FOR LOCKING PUSH-PULL DOORS FROM INSIDE
2¾", 3", 3½", 4"
⅛"
PUSH PLATES
METAL, GLASS, OR PLASTIC
(DOOR PULLS MAY BE MOUNTED, THEN TERMED A PULL PLATE)
NOTE: PLATES USUALLY OF 14 OR 16 GA. (B. & S.) NON-CORRODING METAL OR ⅛" ABRASION-RESISTING PLASTIC. GLASS ALSO USED FOR PUSH PLATES.
6" TO 8" TYPICAL
16" SOMETIMES USED
WIDTH OF DOOR OR WIDTH BETW'N STOPS MINUS ½"
STRETCHER PLATE
(HOSPITAL USE)
METAL OR PLASTIC
8" TO 10" TYPICAL
USUALLY BEVELED THREE SIDES
WIDTH AS ABOVE
KICK PLATE
METAL OR PLASTIC
6"
BEVELED THREE SIDES
WIDTH AS ABOVE
MOP PLATE
METAL OR PLASTIC
40" MIN.
WIDTH AS AT LEFT
ARMOR PLATE
(HOSPITAL USE)
METAL OR PLASTIC
EXTENDED PULL
NOTE: VERY GREAT NUMBER OF DESIGNS AVAILABLE
SLOPING BAR
OFFSET BRACKET
OFFSET BRACKET (OR SLOPING BAR) REQUIRED FOR PUSH BARS TO PERMIT FULL 90° OPENING OF DOORS WITH INTERFERING JAMB TRIM.

LOCATION DIAGRAM


OPERATING MECHANISM OF FLUSH BOLT
CENTER OF LOWER BASE, HOSPITAL ARM PULL
℄ PUSH PLATE
SINGLE PUSH BAR
COMBINATION PUSH-PULL BARS
TOP OF STRETCHER PLATE; CENTER OF DOOR PULL
KNOB
CROSS BAR OF PANIC BOLT
36½" 38" 40" 42" 43" 45" 47" 72"

NOTE: THESE DIMENSIONS ARE ONLY A GENERAL GUIDE IN THE ABSENCE OF OTHER SPECIFICATIONS. THEY WOULD BE UNSUITABLE FOR SOME TYPES OF BLDGS SUCH AS SCHOOLS. SOME DIMENSIONS ARE DETERMINED BY DOOR MANUFACTURERS WHOSE TEMPLATES SHOULD BE CONSULTED.

DO YOU KNOW YOU CAN CUT COPYING COSTS WITH A METHOD THAT'S

60 Times Faster?

...and many times better than old-fashioned "copying"!

IT'S OZALID...

the *speedy copying process* that reproduces anything typed, drawn or written. You get perfect copies of letters, records, reports, photographs, index files, drawings—anything.*

ONLY OZALID GIVES YOU ALL THESE ADVANTAGES ... AND FASTER, TOO!

60 TIMES FASTER because Ozalid duplicates in one minute what used to take an hour manually. Letters, files, photographs, drawings—anything!*

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60 TIMES FASTER because copying errors are eliminated. There is *no check-back* to the original!

60 TIMES FASTER because Ozalid makes copies in *any* size—in sheets or continuous rolls!

FIRST PRINT TO LAST, OZALID COPIES ARE SAME HIGH QUALITY

Because Ozalid is the "Standard of Quality" among sensitized papers!

Because Ozalid's longer shelf-life means materials are fresh. Yes...

Because Ozalid's "speed" is the same month in and month out.

60 TIMES FASTER because you save *waste, labor* and *processing costs!*

**If light won't shine through, an inexpensive intermediary step is taken.*

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Hughes Owens Co., Ltd., Montreal

OZALID, Dept. E3
Johnson City, New York
Gentlemen: Please send free illustrated booklet that fully explains the Ozalid process.

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Company.....

Position.....

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Or call your local Ozalid distributor listed in the classified telephone book.

A DIVISION OF GENERAL ANILINE & FILM CORPORATION. "FROM RESEARCH TO REALITY"

THE RECORD REPORTS

WASHINGTON

(*Continued from page 24*)

housing characteristics including both physical and financing.

Construction cost as given represents cost of labor, materials, subcontracted work, and that part of the builders' overhead and profit chargeable directly to the construction project.

Hospital Progress Report

The U.S. Public Health Service ran its total of new hospital projects approved under the Hill-Burton Act up to 1287 at the end of April. A construction sum of $874,803,000 was represented in this number of jobs approved, and they would add 61,196 beds to the nation's total inventory. The federal share of cost is expected to be around $307,320,000.

Already, 172 projects costing $48,150,000 and providing 4130 new beds are in operation. Under construction are another 631 hospitals costing $457,795,000 and providing 32,552 additional beds. Four hundred eighty-four projects, to cost $368,858,000 are in the "initially approved" category. These eventually will add 24,504 beds to the supply. Health centers constructed under the program number 234: 45 are operating, 86 are under construction, and 103 have been given initial approval.

The greatest gains in the approval of projects so far will accrue to Alabama, Kentucky, Mississippi, New York, North Carolina, Ohio, Pennsylvania, Texas and Puerto Rico, each of which will gain 2000 beds or more from construction of new hospitals. The program purposely was given initial impetus in the Southern states where the need was felt to be the greatest. Results of this prime effort are showing up now in the tabulation of completed projects. Florida, for example, has 314 beds completed and operating; Georgia, 267; Louisiana, 457; North Carolina, 364; and Texas, 633.

FNMA and Reorganization

Among several unsettled matters of vital importance to the building industry was final disposition of the Federal National Mortgage Association, the secondary market depository for housing loans insured by the Federal Housing

(*Continued on page 154*)

CORBIN
AUTOMATIC EXIT FIXTURES
EMINENTLY SAFE AND CERTAIN
for QUICK EXIT
Sturdy drop-forged levers
precision construction in
solid brass or bronze
• Corbin mechanical safeguards have been approved over a period of years for installation in SCHOOLS and other buildings where people congregate.
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DIVISION
THE AMERICAN HARDWARE CORPORATION
New Britain, Connecticut
CORBIN
SCHOOL ZONE

Ramset Fastening System
FASTENING SYSTEM
Cost comparison sheet for General Contractors Inc.
(name of job)
This form is provided for estimating costs on any job with Ramset Fastening System as compared with present method, and to indicate possible savings with Ramset
In estimating fastening time with present system, use actual time of workmen doing the work, including making fastener hole, inserting plug and attaching fastener. Use same method for Ramset, which will ordinarily be less because the fastener itself is set in one operation.
Materials cost for present method should include plugs and fasteners, and for Ramset, should include both fastening charge and the fastener itself.
Estimated Present Method
Actual Ramset System
NO. OF FASTENINGS 7186
TIME REQUIRED 2371.9 HOURS 484.3 HOURS
COST AT $ 2.00 PER HOUR $ 4,742.80 $ 968.60
COST OF MATERIALS 718.60 1,651.68
TOTAL COST $ 5,461.40 $ 2,620.28
COST SAVED WITH RAMSET SYSTEM $ 2,841.12
52 %
SAVED PER FASTENING WITH RAMSET SYSTEM $ .39
TIME SAVED WITH RAMSET SYSTEM 1,887.1 HOURS
79.5 %
$2,841.00 SAVED
WITH Ramset
FASTENING SYSTEM

FOUR MINUTES per fastening (total time on job) with Ramset System instead of NINETEEN MINUTES with his old method saved this contractor $2,841.00 on one steel fastening job. Instead of slow, laborious, costly drilling—just load the self-powered, light, Ramset Fastening Tool. Then—READY! RAM! SET! Quick, easy, economical—and tight. *Actual fastening time, less than one minute per fastener!*

Compare your fastening costs into steel, concrete and other hard materials. See how lightning-fast Ramset cuts costs from 50% to 90% and sets fasteners up to 60 times faster than old-fashioned methods. With 65 sizes and types of pins and studs to choose from, Ramset can be specified for almost any construction fastening.

To reduce fastening costs and finish your clients' projects faster, call your local Ramset Specialist or ask us for details.

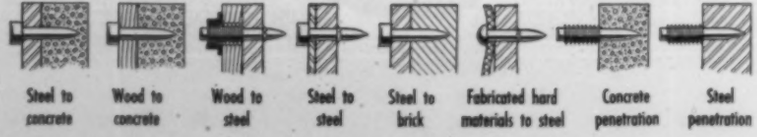
Ramset System
SAVES TIME . . . CUTS COST ON JOBS LIKE THESE:

Fastening—

- Metal framework to walls, floors and ceilings.
- Supports to concrete, brick and steel.
- Hangers for piping and duct work.
- Wood sills to concrete.
- Metal roofs or walls.
- Wiring, conduits and other electrical installations.
- False ceilings and lighting fixtures.

Stemco Corporation • Cleveland 16, Ohio
Member of Producers' Council

FASTEN FASTER, EASIER, CHEAPER WITH RAMSET



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WASHINGTON
(*Continued from page 152*)

Administration and guaranteed by the Veterans Administration. This secondary market is now a subsidiary of the big Reconstruction Finance Corp. A reorganization plan now pending before Congress would transfer the secondary market outlet, known to the trade as Fannie Mae, from its parent agency to the Housing and Home Finance Agency. Unless vetoed by either branch of Congress before July 8, this plan automatically goes into effect.

Continuation of the loan buying and selling activities of FNMA is extremely important to the current high volume of home construction. Builders have expressed the opinion that this support for ready home purchase credit, or an equivalent, must be maintained to bolster the record home building pace.

The importance of this function to the sustained high rate of new home starts is indicated in the belief of some RFC officials that it has become, in effect, a primary market for housing mortgages; this to the extent it largely predetermines the volume of business to be written and dictates capacity of local lenders to expand their lending operations. Of course, RFC officials have been resisting the President's proposed transfer of FNMA to the Foley agency. They say Fannie Mae is the member of the corporation family that keeps the whole RFC on the black side of the ledger.

The purchase and sale of these government-backed home loans made $12 million for RFC during the first nine months of the fiscal year ending June 30. Some go so far as to say that RFC, without the money-making powers of its Fannie Mae, would wind up in the red, all else being equal. But tied in with the Administration endeavor is another plan to transfer all other activities of the big lending agency to the Commerce Department, thereby entirely dissolving its independent status. The two plans, along with a third to transfer the prefabricated housing loan program from RFC to the federal housing agency, went to Congress at the same time.

At the end of March, FNMA had total holdings approximating $1 billion.

(*Continued on page 156*)

Announcing...

Corning Rolled Lens Panels in a new Water White Crystal

Here is another new product of Corning research . . . Rolled Lens Panels. There is nothing like them on the market today. A brand new lightingware for controlling fluorescent lighting, they add beauty and improved brightness control to any installation. The lenses are so designed that there is a substantial reduction of side and end fixture brightness.

Lighter in weight than previous products of this type, Corning Rolled Lens Panels are also lower in cost. For example, two 24″ frame mounted panels will mean a saving in glass cost of nearly 12% over four of the old type 12″ pressed panels. Reduction in weight means easier mounting and installation. Wider applications are possible.

Corning Rolled Lens Panels are available 11″ wide and up to 48″ in length in both Twinlens and Unilens patterns. Longer lengths and special widths can be supplied on order. Take advantage of the possibilities offered by this truly new lightingware. Write for information today.

CORNING GLASS WORKS
CORNING, NEW YORK
Corning means research in Glass

FOR EFFICIENT, ATTRACTIVE LIGHTING...
CORNING ALBA-LITE for diffusion of fluorescent light ... CORNING FOTA-LITE for high level illumination ... CORNING brand LENS PANELS and PYREX brand LENSLITES for prismatic light control

CORNING GLASS WORKS
Dept. AR-7, Corning, N. Y.
Please send complete information on Corning Rolled Lens Panels.

Name_____ Title_____
Firm_____
Address_____
City_____ Zone_____ State_____

When it's time to select...

REMEMBER... Decorative Architectural Concrete Slabs made with **ATLAS WHITE CEMENT**

YOUR CLIENT will appreciate your selection of handsome Architectural Concrete Slabs for his building. For you thus advise not only smart, modern appearance, but also economy of erection.

In the building above*, thin precast slabs 70 square feet in area were used. Large units reduced the number of joints, thus less pointing up was necessary. The matrix of Atlas White Cement was tinted with coloring pigment to blend with colored aggregate. A special corrugated design and the absence of horizontal joints increased the decorative effect.

Color, texture and design possibilities of Architectural Concrete Slabs made with Atlas White Cement are unlimited. For further information on this use of Atlas White Cement, as well as for stucco, terrazzo and portland cement paint, see SWEET'S Catalog, Section 4E/7a and 13C/5, or write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, N. Y.

*Rockingham Clothing Store, Richmond, Va. Slabs made with Atlas White Cement by Economy Cast Stone Co., Richmond.

AR-S-17

FOR BEAUTY AND UTILITY

ATLAS WHITE CEMENT

FOR TERRAZZO, PAINT, SLABS, STUCCO

NBC SUMMER SYMPHONY—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—June to September*

THE RECORD REPORTS

WASHINGTON

(*Continued from page 154*)

Outstanding commitments to purchase amounted to $1.4 billion more. Such a volume of activity has an obvious impact on the government's entire housing program, said President Truman, in taking his plans to Congress. He continued his arguments as follows:

"The present high volume of activity by the FNMA has radically altered the situation which existed in 1947 and has made it essential that these market operations be geared more closely into the government's housing program. The manner in which these market operations are administered has a direct effect on the kind of mortgages written, and the availability and cost of mortgage credit. The secondary market must be administered therefore at all times in full consistency with other programs affecting housing credit."

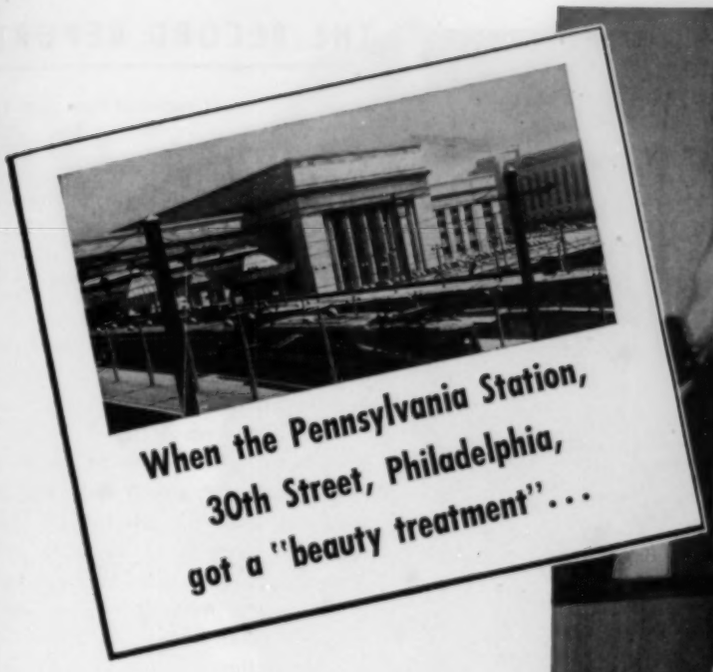
The proposed transfer would not prevent RFC from making loans to business enterprises on the security of real estate, or from accepting mortgages as collateral on a business loan.

Other New Proposals

Submission of the organization plans in question halted temporarily the plans for submitting a new scheme of backstopping the private housing loans. Sponsors of a new plan to create private mortgage corporations chartered by HHFA wanted to see how Congressional opinion on the proposed Fannie Mae transfer would shape up before going ahead. It was felt the chartering of private mortgage corporations to buy FHA-insured and VA-guaranteed mortgages would be an added incentive to private lenders to extend low-interest money offers to prospective home buyers and builders.

Meanwhile, the secondary market activity of FNMA had slowed down to a walk. Congress gave it $250 million with which to resume buying loans. It stopped purchase in mid-March when its original authorizations of $2.5 billion dwindled to almost nothing. A request for $250 million more is part of the new scheme involving establishment of private, chartered mortgage corporations, it was said. The timetable for the new legislation is such that RFC

(*Continued on page 158*)



When the Pennsylvania Station, 30th Street, Philadelphia, got a "beauty treatment"...

No drilling, *no broken tile, when these Scott Special Adhesives were used to install Scott #993 cabinets at Pennsylvania Station.*

Scott

SPECIAL ADHESIVE

CUT WASHROOM REMODELING COSTS!

THE CHANGEOVER from old to streamlined washroom fixtures at Pennsylvania Station was simple, rapid . . . and economical! Walls were not marked, no drill holes were necessary, tile replacements were eliminated!

How was this accomplished? Scott Special Adhesive was specified for the installation.

Scott Special Adhesive comes in rubber pad form surfaced on both sides with a silver colored adhesive. It will form a strong bond on any firm, clean surface such as glass, metal, tile, marble, brick and hard enamel. It's easy to use.

Get Scott Special Adhesive—and the services of Scott trained and experienced consultants—on your team for your next washroom remodeling. Contact "Washroom Advisory Service," Scott Paper Company, Chester, Pennsylvania.

SCOTT

Symbol of Modern Washrooms

Trade Mark "Washroom Advisory Service" Reg. U. S. Pat. Off.

Send for your FREE adhesive samples today!

Washroom Advisory Service, Dept. F
Scott Paper Company
Chester, Pennsylvania

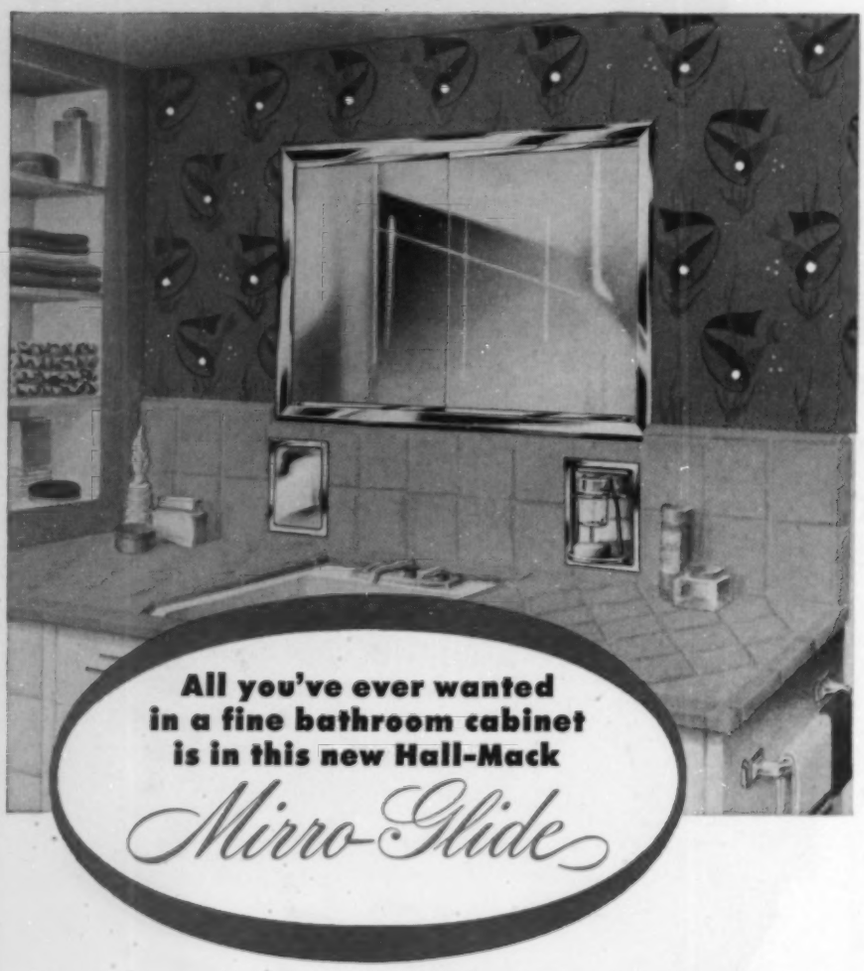
Please send me free samples of Scott Special Adhesive.

Name_____

Company_____ Title_____

Address_____

City_____ Zone____ State_____



HERE IS THE very *most* in bathroom cabinet beauty and convenience... two sliding plate glass mirror doors which conceal a spacious, double size recessed cabinet.

There's *beauty* in the large handsome expanse of plate glass mirror (39"x22") completely bound by a wide chrome frame . . . in the gleaming white baked enamel steel cabinet...in the fine Hall-Mack workmanship and finish.

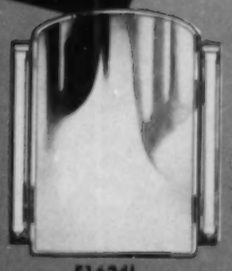
And there's real *convenience* in the big divided cabinet with more than *twice* the room of an ordinary cabinet ...in the six fully adjustable glass shelves...in the smoothly sliding mirror doors which always provide a 20"x22" mirror for use even when one cabinet is opened.

Wherever you want the ultimate in cabinet quality, and the most in beauty and practical convenience—install the new Hall-Mack Mirro-Glide.

HALL-MACK Quality CABINETS for Every Bathroom Style and Budget

F1826

In the complete Hall-Mack line are cabinets for mansion or modest cottage, all made to exacting quality standards to give years of satisfying service. Hall-Mack seamless steel cabinets with lifetime porcelain interior . . . fluorescent and lumiline lighted cabinets . . . seamless enameled cabinets . . . wall or recessed types . . . provide a selection for every requirement. Write for folder. Hall-Mack Company, 1344 W. Washington Blvd., Los Angeles 7, Calif.


F1624L

And remember . . .
Hall-Mack accessories . . .

THE RECORD REPORTS

(*Continued from page 156*)

estimates it will have approximately $400 million cash buying power in the secondary market (including the $250 million to be requested) as soon as the private institutions are chartered.

This knowledge of impending changes in the secondary market arrangement is responsible for the market lag now being experienced. Many are expecting FNMA to sell its wares at par to the local chartered groups if and when they are created. In the interim, FNMA is becoming more strict in cases where commitment extensions or application transfers are requested. The agency wants to make certain the applicant is not just stalling, officials said. Transfers will be permitted only when Fannie Mae is convinced the applicant is not "just brokering" due to the shutting off of future commitments.

The Housing Act of 1950 discontinued the authority for secondary market purchase through issuance of prior commitments. About $1.4 billion of such "futures" were outstanding at the time the agency stopped buying and these commitments, of course, will be honored.

FNMA sales of mortgages have been increasing this spring. From September, last year, to May 1950, the Association disposed of nearly $200 million worth of mortgages, most of the sales going to insurance companies and other large investors in block quantities. In April, the sales totaled $63 million.

Shorts

• Home builders spoke out against widely-advertised schemes whereby persons can erect their own houses. An announcement from N.A.H.B., following the meeting of executive directors of that organization, condemned the "do it yourself" books and other publications giving the impression that vast sums can be saved if owners build their own homes. Examples of the N.A.H.B. statement: "Too many innocent persons are lured into investing their time and money in ill-conceived building plans." "No one should attempt to build his own home unless he is fully experienced in all phases of construction, site planning, design, finance and well backed financially." "Badly built, ill-planned, unsightly homes erected by some owners guided by books will prove a permanent

(*Continued on page 160*)

All this crowd to see a house?

Yes, because it's one of those modern, new homes that attract people faster than sugar draws flies. And one of the big reasons is its Bryant automatic gas heating that's going to make it sell or rent *faster*, and for *more money!*

It's no secret to Mr. and Mrs. America that the Bryant nameplate means quality. In fact, you'll hear many a story of how the Bryant that Uncle Jim bought back in the early 1900's still is doing a fine job.

Today, Bryant offers the most reliable, most diversified gas heating equipment ever presented to help make your *houses* the kind of *homes* America wants.

There's a Bryant representative near you. Call him or mail the coupon. Let him aid with your heating problems . . . and tell Officer Clancy to stand by to handle the crowds when you open your Bryant-heated homes!

Let the pup be furnace man . . . and water boy, too!

bryant

AUTOMATIC HEATING

The most complete line of gas heating equipment in the nation

Bryant Heater, Dept. 234,
17825 St. Clair, Cleveland, Ohio

( ) Send me the new booklet that tells the Bryant story. ( ) Have your distributor call on me.

Name_____

Company_____

Address_____

City_____ State_____

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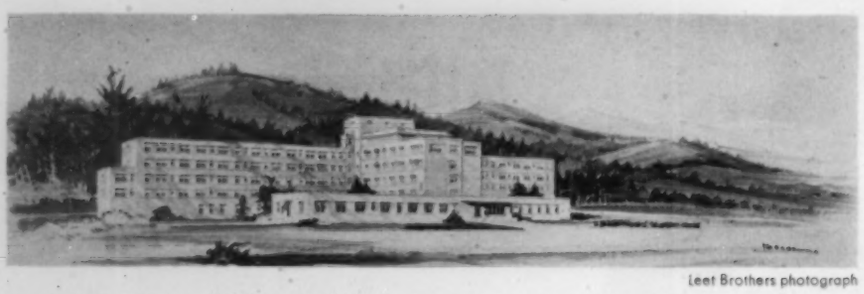
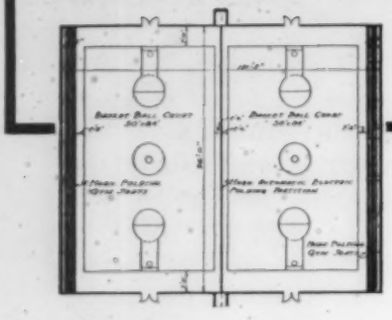


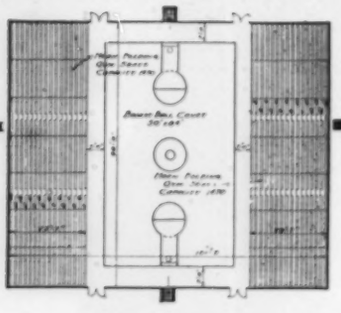
Leet Brothers photograph

T.B. Hospital at Anchorage, Alaska, planned for easy conversion to general use

UTILIZE YOUR GYM SPACE WITH HORN



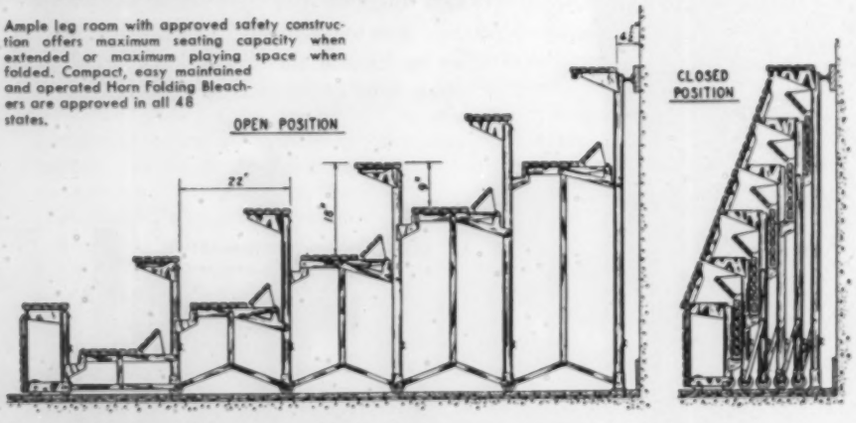
Two regulation basketball courts separated by a Horn Automatic Electric Folding Partition. Horn Folding Bleachers in folded position.



HORN FOLDING BLEACHERS extended increases the seating capacity for the BIG GAME! Horn Folding Bleachers will meet your requirements.

HORN FOLDING BLEACHERS

Ample leg room with approved safety construction offers maximum seating capacity when extended or maximum playing space when folded. Compact, easy maintained and operated Horn Folding Bleachers are approved in all 48 states.



ROWS	FLOOR SPACE IN USE	FLOOR SPACE *CLOSED	**HEIGHT	ROWS	FLOOR SPACE IN USE	FLOOR SPACE *CLOSED	**HEIGHT
3	4′ 9″	1′ 8⅜″	3′ 0″	12	21′ 3″	4′ 3½″	9′ 9″
4	6′ 7″	2′ 0⅛″	3′ 9″	13	23′ 1″	4′ 6½″	10′ 6″
5	8′ 5″	2′ 3⅞″	4′ 6″	14	24′ 11″	4′ 9⅛″	11′ 3″
6	10′ 3″	2′ 6⅝″	5′ 3″	15	26′ 9″	5′ 1¼″	12′ 0″
7	12′ 1″	2′ 10⅛″	6′ 0″	16	28′ 7″	5′ 4⅝″	12′ 9″
8	13′ 11″	3′ 1⅝″	6′ 9″	17	30′ 5″	5′ 8″	13′ 6″
9	15′ 9″	3′ 5″	7′ 6″	18	32′ 3″	5′ 11⅝″	14′ 3″
10	17′ 7″	3′ 8⅝″	8′ 3″	19	34′ 1″	6′ 2¾″	15′ 0″
11	19′ 5″	3′ 11⅞″	9′ 0″	20	35′ 11″	6′ 6⅛″	15′ 9″

SINCE Horn 1909

*Dimension includes 4½ in. space between top seat and wall.
**Height in open position same as closed. For Bleachers higher than 20 Rows write for complete details and dimensions.

HORN BROTHERS COMPANY
DIVISION OF HORN INDUSTRIES • FORT DODGE, IOWA, U.S.A.

eye sore to the community." "For 99 per cent of the people, trying to build their own home makes as much sense as building their own car."

• H. R. Northup, executive vice president of the National Retail Lumber Dealers Association, said there need be no gray market in building materials. Buyers, he advised, should follow a steadfast policy of obtaining their supplies from established trade sources and refuse to deal with anyone attempting to profit from "temporary local shortages." There were growing reports of these shortages developing spottily and repeated warnings that gray markets might develop.

• Of all materials, lumber seemed to be giving builders the biggest troubles. Bad weather and jumping demand depleted mill stocks to 6277 million ft at the end of the first quarter, 1950, and unfilled orders increased 25 per cent during the first three months.

T.B. Hospital For Alaska Designed For Conversion

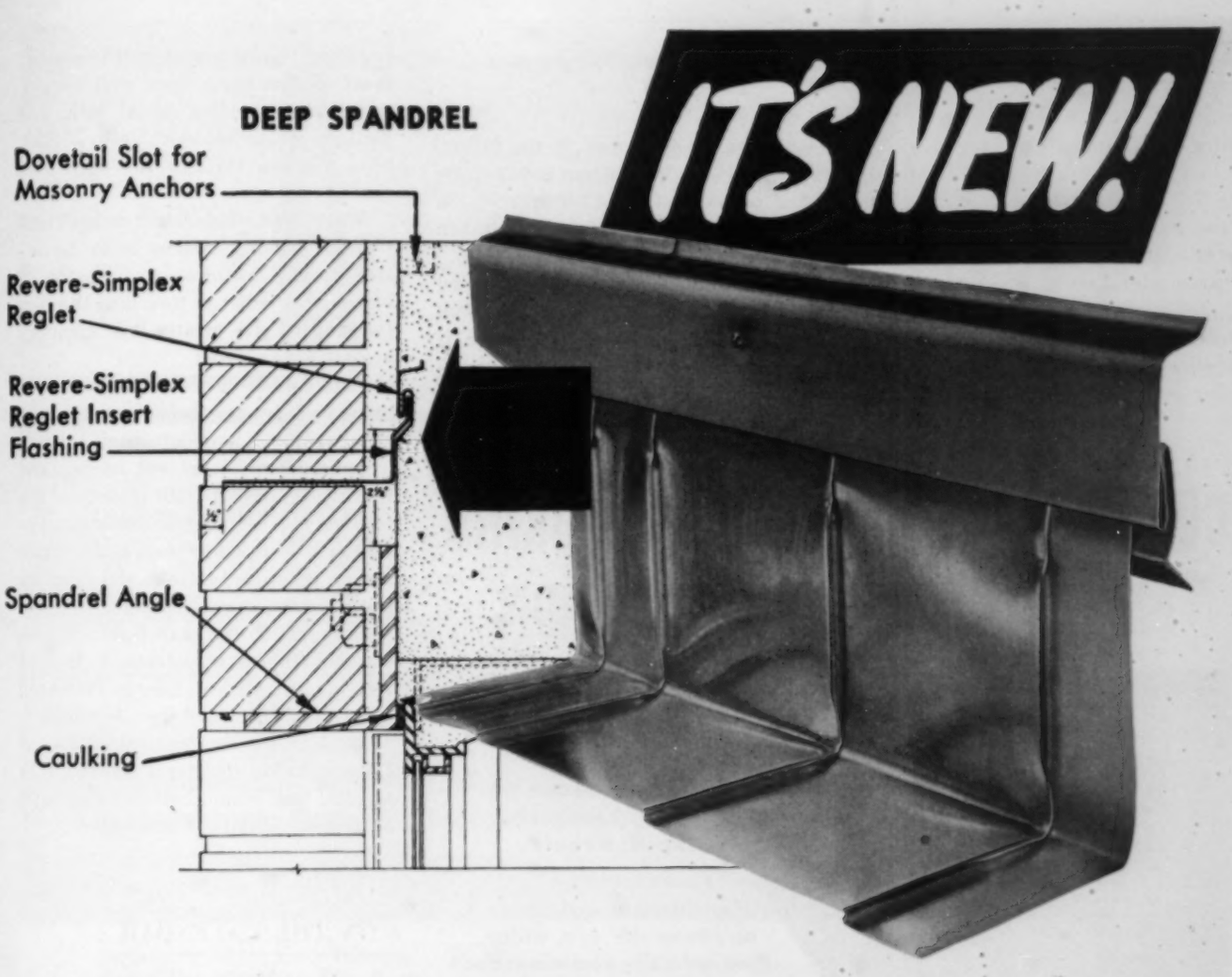
The high incidence of tuberculosis among the native Indians of Alaska presents peculiar architectural problems in the designing of hospital buildings. New hospitals of the Native Alaska Service, part of the Bureau of Indian Affairs, Department of the Interior, are being constructed with a view to easy conversion of T.B. rooms and wards from special to general type.

Example of this construction is the new T.B. hospital now eight to ten per cent completed for the Service at Anchorage. Plans were drawn by Foss and Malcolm at the Juneau office, with Laurance P. Johnston working as associate. Mr. Johnston, formerly of Evanston, Ill., returned from a year's work in Alaska last Summer and is continuing his hospital specialization work in Washington, D. C.

The cruciform design for the T.B. unit at Anchorage was the first of several to be drawn for the entire installation. Others include a nurses' quarters structure, service staff quarters and three apartment buildings for staff and other personnel. Completed, the project will cost about $6¾ million. The initial building will stand in an area 400 ft by 400 ft.

Contract was awarded last July to J. C. Boespflug Construction Co., Seattle, Peter Kiewit Sons Co., Omaha, and

(*Continued on page 162*)



REVERE-SIMPLEX REGLET SYSTEM
For Waterproofing Spandrel Beams

● The Revere-Simplex Reglet System is an economical and efficient method of flashing spandrel beams and column faces with enduring copper. This system offers the following advantages:

Affords greater moisture protection for the building.

Eliminates the necessity of flashing the entire face of each spandrel beam. In that way, it not only avoids interference with wall ties, stone anchors, angle bolts, etc., but also insures substantial economies through a large saving in flashing material.

Diverts all seepage to the exterior wall face, and prevents rusting of the steel work.

Is based upon the use of the Revere-Simplex Reglet, which is a simple, practical, easily installed receiving device for securing metal flashings in concrete. This patented reglet provides a permanent watertight connection between concrete and copper flashing, for all concrete surfaces.

The Revere-Simplex Reglet not only overcomes installation difficulties experienced with ordinary "open slot" metal reglets, but provides a substantial saving in cost as well. This is due to its many exclusive features, all of which cut down installation time and insure a superior flashing installation.

Write today for your copy of the new 6-page folder which describes the Revere-Simplex Reglet System. This folder includes short form specifications for the Revere-Simplex Reglet System and detail drawings showing where and how copper waterproofing should be used below the roof line.

Revere products now available through Revere Distributors include: Sheet and Roll Copper for roofing, gutters, flashing, etc.; Lead-Coated Copper; Revere-Keystone Thru-Wall Flashing; Revere-Simplex Reglet and Reglet Insert Flashing; Revere-Keystone Vertical Ribbed Siding. A Revere Technical Advisor will always be glad to consult with you without obligation.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

• • •

Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.

Sales Offices in Principal Cities, Distributors Everywhere.

Copper Makes Common Sense

(*Continued from page 160*)

Morrison-Knudsen Co., New York, on a combined bid of $4,374,254. Moving in on the job immediately, the contractors finished the foundation and a portion of the first floor before the hard Alaska winter set in.

Bed division in the 400-bed hospital will be 300 T.B. beds against 100 general medical at the start. Flexibility in planning permits this ratio to be changed easily as needs change in the future.

Total cubic foot content is 1,764,289; this places cost at $2.48 per cu ft, considered unusually low for Alaskan construction. Per head cost is $10,936.

The building will be of reinforced concrete with an 8-in. to 12-in. wall construction. A waterproof mastic is being spread on the inside of the exterior wall surface and a 1-in. gypsum insulation board pasted on the mastic. Next to this is an open web 3¼ in. metal stud, holding metal lath and plaster for the interior finish. Utility lines will run through the open web stud.

A new type combination radiant and radiator heating system is to be installed. This features extra lengths of lead pipe to radiators threading through the stud to give greater heat capacity against Alaska's cold.

Plans call for one full story of aboveground construction before patient areas are provided. A psychiatric unit is being included. Three years will be required to complete the T.B. unit because of the relatively short building season at Anchorage. Contractors can build forms during the winter months and open up full construction each spring.

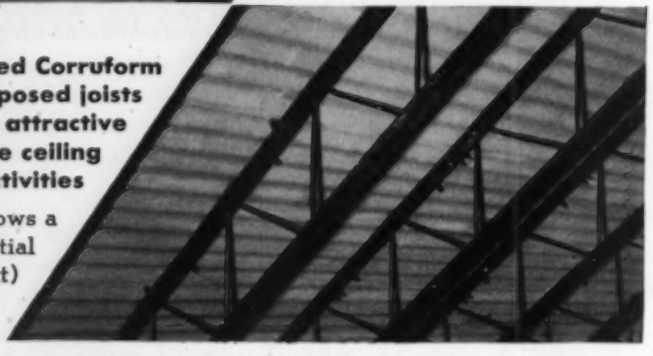
Engineers on the project are: Stevenson and Rubens, structural; J. Donald Kroeker, mechanical; George Pettingell and Grant Kelley and Co., electrical.

Mr. Johnston also designed the Mount Edgecumbe sanatorium, a 200-bed T.B. hospital just completed at Sitka, and other smaller Alaskan hospitals.

CORRUFORM MEANS GOOD LOOKING EXPOSED JOIST CONSTRUCTION

Corruform performs over beams on wide spacing in exposed roofs

(View shows 2½" Corruformed concrete on beams 45" c/c, wider than normally recommended)



Galvanized Corruform and exposed joists is a light, attractive adequate ceiling for many activities

(View shows a residential basement)

High-strength, light weight Corruform is economical. No sag or material waste for conventional joist construction.

Bright, decorative corrugated pattern makes an attractive exposed ceiling. Plain or galvanized—vinylprimed for painting—exposed ceilings are uniform, economical and suitable for many occupancies. Under insulated concrete roofs, Corruform is an ideal vapor seal.

SPECIFY CORRUFORM

Economical Strength 100,000 p s i

One quality, uniform standard.

Patented Corruform is your guarantee for good construction.

ON THE CALENDAR

Through July 16: Exhibition of entries, International Competition for Low-Cost Furniture Design, Museum of Modern Art, New York, N. Y.

August 27–Sept. 2: 20th International Congress for Housing and Town Planning, City University, Amsterdam, The Netherlands.

Through Sept. 4: Chicago Fair of 1950, dramatizing achievements of science, agriculture and industry.

Sept. 18–21: 52nd Annual Convention, American Hospital Association, Atlantic City, N. J.

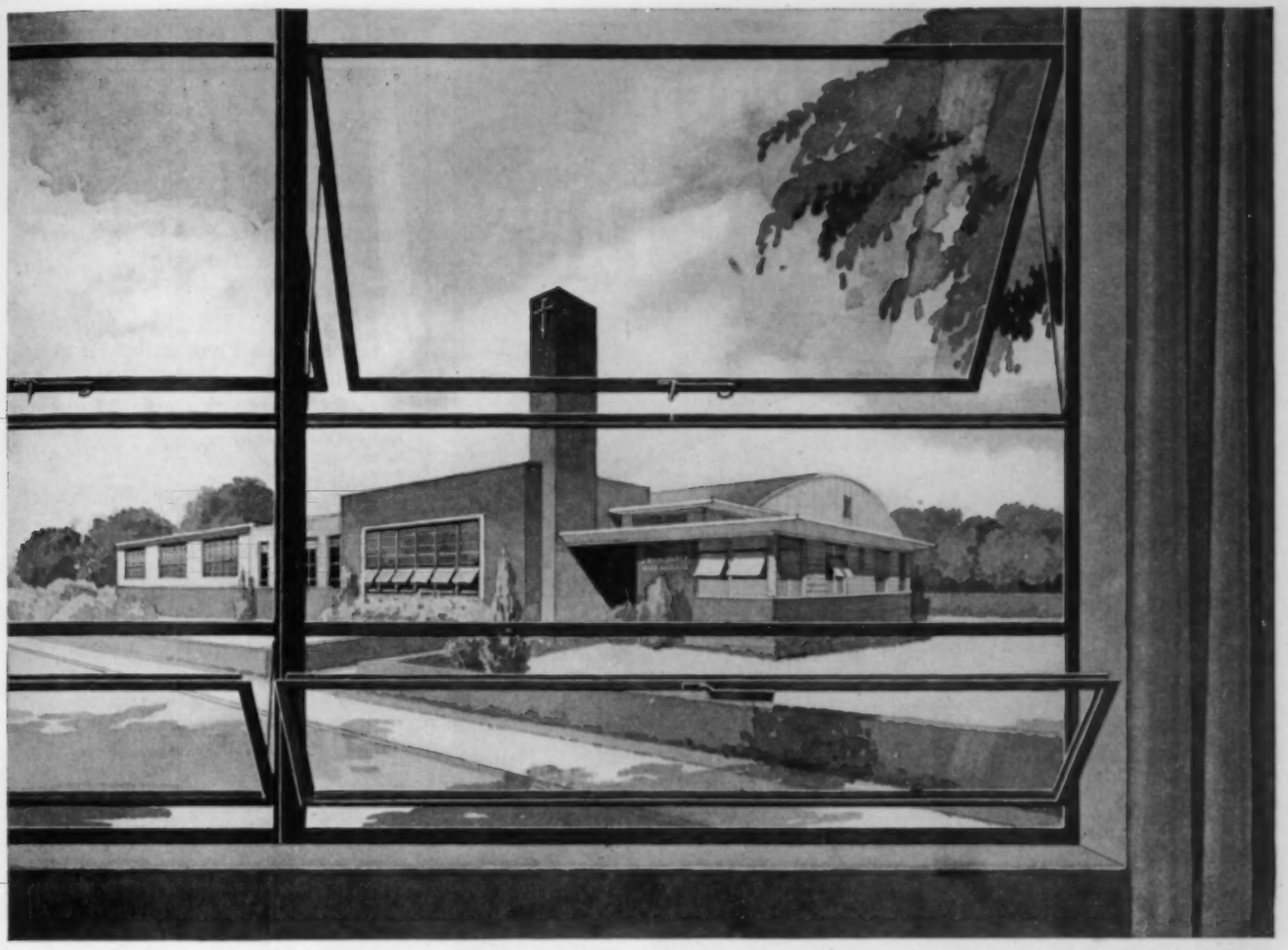
OFFICE NOTES

Offices Opened, Reopened

• Frederick T. Bock has opened an office for the general practice of architecture at 95 Norfolk Drive, W., Elmont, L. I., N. Y.

• Everett Brown Associates, Inc., consultants on product development, color and design and merchandise coordination, have opened offices at 1448 Astor St., Chicago 10, Ill.

(*Continued on page 164*)



Immaculata High School, Birmingham, Ala. Director: Rev. E. J. Lawler. Architect: Wilmot C. Douglas, Birmingham, Ala. Contractor: Daniel Construction Co., Greenville, S. C.

Proper daylighting and adequate natural ventilation are vital requirements in modern school planning. Studies have proved conclusively that metal windows provide the best source of daylight plus controlled ventilation. With Lupton Metal Windows, rooms have a maximum amount of daylighting, even on overcast days. Better vision for students is stimulated through Lupton Metal Window design because of the greater glass area and slender frames and muntins. Drafts and breezes can be controlled for room comfort with ventilators that open to any desired degree despite inclement weather. Lupton Metal Windows are weathertight. Will not rot, warp, swell or rattle. There is a Lupton Metal Window for every type of building—industrial, residential, commercial. Write for our Catalog or see it in Sweet's.

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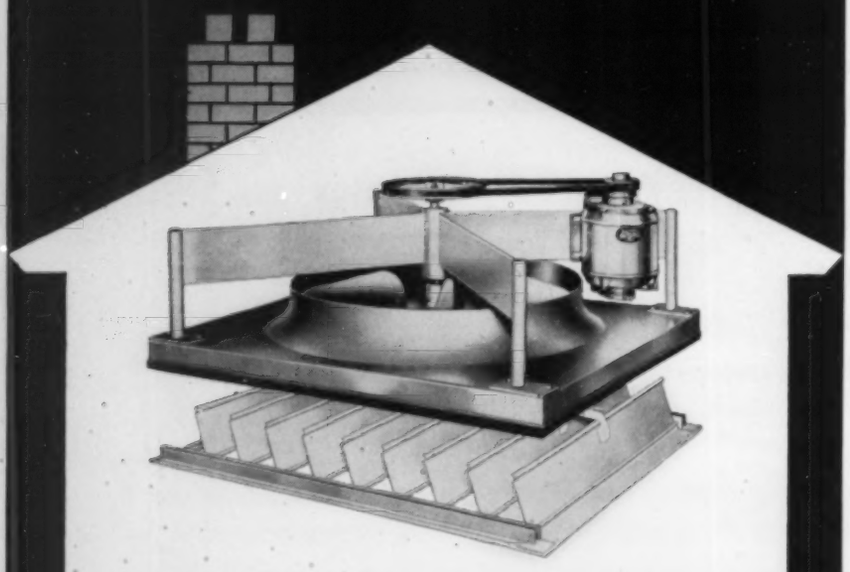

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THE RECORD REPORTS

(*Continued from page 162*)

• Stanhope Blunt Ficke, A.I.A., announces the establishment of a general practice in contemporary architecture, with offices at 120 E. 79th St., New York 21, N. Y.

• Arthur Louis Finn, industrial design consultant, has opened an office at 270 Park Ave. to practice architectural and industrial design.

• Giffels & Vallet, Inc., and L. Rosetti, Associated Engineers and Architects of Detroit, have announced the opening of a new office at 2121 Commerce Building, Houston, Tex. Col. William P. Cornelius has been named manager of the office.

• Beatrice West, formerly associated with the Rahr Color Clinic, has opened offices at 184 E. 72nd St., New York, N. Y.

New Firms, Firm Changes

• Bassetti & Morse, A.I.A., Architects, have announced that Wendell H. Lovett has been made an associate of the firm.

• In a transaction involving "several million dollars," controlling stock of The H. K. Ferguson Company, Industrial Engineers and Builders, has been purchased by Morrison-Knudsen Company, Inc.

The stock involved was formerly owned by the Oman interests of Nashville, Tenn. The action was taken, according to a joint statement by the two companies, "in the interest of broadening the field of activities of both organizations."

Otto F. Sieder will continue as executive vice president and general manager of The H. K. Ferguson Company and there will be no change in the management, personnel or policy of the company.

• Frank J. Ginocchio and Edwin B. Cromwell, who formerly practiced architecture as Ginocchio and Cromwell, announce the formation of a partnership under the firm name of Ginocchio, Cromwell and Associates, with W. Hal Phelps, Dietrich Neyland, Charles B. Carter and H. R. Mitchell Jr. as associates. The office is at 201 Hall Building, Little Rock, Ark.

(*Continued on page 166*)

TRUSCON
MARK OF MERIT PRODUCTS

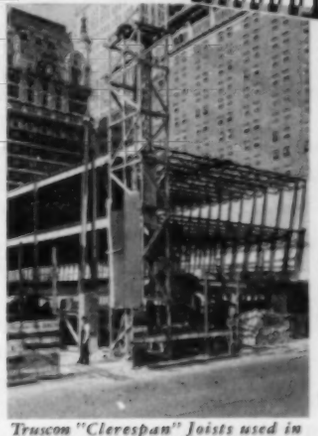
TRUSCON "Clerespan" Joists

Long on length...

Truscon "Ferrobord" Steeldeck being used with "Clerespan" Joists for ideal fire-resistant roof construction.

Truscon "Clerespan" Joists were used to obtain large unobstructed areas in the Star Market, Newtonville, Mass.

Truscon "Clerespan" Joists in Heindel Oldsmobile Garage, Youngstown, O.



Truscon "Clerespan" Joists used in Adolphus Garage, Dallas, Texas.

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THE RECORD REPORTS

(*Continued from page 164*)

• Harold R. Sleeper, F.A.I.A., Charles G. Ramsey, A.I.A., and Joanna K. Arfman announce that they will continue the architectural practice of the late Frederick L. Ackerman, F.A.I.A., at 25 W. 44th St., New York 18, N. Y. Mr. Sleeper's practice will also include consultations for architects and material manufacturers, technical and product literature.

New Addresses

The following new addresses have been announced:

The American Chamber of Commerce of Mexico, Edificio Bearn, Plaza Santos Degollado 10–101–103, Mexico, D. F.

The Architects Collaborative, 96 Mt. Auburn St., Cambridge, Mass.

Harry Bernard Clausen, Architect, 2409 Telegraph Ave., Berkeley 4, Calif.

H. T. Lindeberg, 270 Park Ave., New York, N. Y.

Raymond Loewy Associates, 488 Madison Ave., New York, N. Y.

Maynard Lyndon, A.I.A., 6030 Wilshire Blvd., Los Angeles 36, Calif.

F. H. McGraw Company of Canada Ltd., 1520 Mountain St., Montreal, Que.

William M. Rich, Architect-Engineer, 30 N. LaSalle St., Chicago 2, Ill.

Charles A. Scheuringer, A.I.A., Western Saving Fund Bldg., Rm. 510, Broad and Chestnut Streets, Philadelphia 7, Pa.

C. A. Smith & Associates, Architects, 1107 Fourth Ave., Albany, Ga.

Stanhope and Manning, Architects, 902 Orange St., Wilmington, Del.

Ernest F. Jones, Heating Engineer, 750 Glencoe Rd., Glencoe, Ill.

Abraham Waronoff, Architect, The Kencord Bldg., Kennedy and Second Streets, N.W., Washington, D. C.

AWARDS

• U. S. architects have won the highest awards for examples of executed work shown at the VII Panamerican Congress of Architects held this Spring at Havana.

The United States also won the First Grand Prize of Honor for its architectural exhibit of 600 panels of photographs and models, arranged and catalogued by The American Institute of

(*Continued on page 168*)

PACIFIC GAS & ELECTRIC CO.

SELECTS VERSATILE UNISTRUT TO SUPPORT CONDUIT RUNS

Completely adjustable Unistrut simplifies the most difficult problems of supporting complex conduit runs used in distribution systems—permits fast, on-the-job framing assembly where all adjustments are made by just loosening a bolt, and where supporting members are added as work progresses. No drilling, no welding, no special tools or equipment. Saves time—cuts costs. Try Unistrut on your next job to see how much quicker, better and more economically the work can be done.

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THE RECORD REPORTS

(*Continued from page 166*)

Architects. Mexico was awarded Second Grand Prize; Cuba, third.

Individual awards were based on excellence in design for buildings in various categories which had been constructed from 1947 through 1949. Countries having the greatest numbers of highest awards were awarded the grand prize.

Individual awards to architects in the United States and possessions were: Section A — Silver Medal, Hotel Caribe Hilton, Puerto Rico; Special Awards, The House in the Museum Garden, Marcel Breuer, New York City; Dwelling in the Colorado Desert, Richard J. Neutra, Los Angeles, Calif.

Section B — Honor Medal, Classroom and Laboratory Building, Illinois Institute of Technology, Mies van der Rohe, Chicago; Silver Medal, University of Miami, Robert Law Weed and Associates, Miami; Award, Elementary School, Kump and Falk, San Francisco.

Section C — Gold Medal, Crown Hills Clinic, Chiarelli and Kirk, Seattle, Wash.; Silver Medal, New York University Bellevue Medical Center, Skidmore, Owings and Merrill, New York and Chicago; Award, Hospital de Puerto Rico, Pedro La Amadro.

Section D — Award, commercial work, Raphael S. Soriano, Los Angeles; Prudential Building, Wurdeman and Becket, Los Angeles; Special Award, Office Building, Pietro Belluschi, Portland, Ore.

Section E — Honor Medal, the Red Rocks Amphitheater, Burnham Hoyt, Denver.

Section F — Award, the Michael Reese Hospital Redevelopment Program, Chicago Section; Silver Medal, Institute of Design, Chicago; Award, School of Architecture, University of Oklahoma; School of Architecture and Planning, M.I.T.; Department of Architecture, University of Illinois; College of Architecture, Cornell University.

Section G — Thesis Award, School of Architecture, Columbia University.

Section H — Honor Medal, Constructive Systems, Wachsman and Gropius, Cambridge, Mass.; Silver Medal, Decoration, Knoll Associates, New York, N. Y.

The Grand Honor Prize went to TVA.

• Three first prizes of $100 each have been awarded in the 23rd annual collaborative competition sponsored by the Association of the Alumni of the American Academy in Rome for students of architecture, landscape architecture, painting and sculpture in the colleges and art schools of the United States.

The problem, prepared by John Harbeson, architect, was "A National Military Cemetery Overseas," to be located in Hawaii. The specified site was the Punch Bowl, the crater of a long extinct volcano.

One of the three first prizes went to a team from Cooper Union, composed of Charles Rivkin, architect; Irwin Rosenhouse, sculptor; Theresa Bardizbanian, landscape architect; and Sol Zaretsky, painter.

Another of the first prize winners was a group from the University of Pennsylvania and the Pennsylvania Academy of Fine Arts: W. L. Winchell, architect; E. F. Hoffman Jr., sculptor; and John Hanlon, painter.

A team of students from Washington University, St. Louis, also won a first

(*Continued on page 170*)

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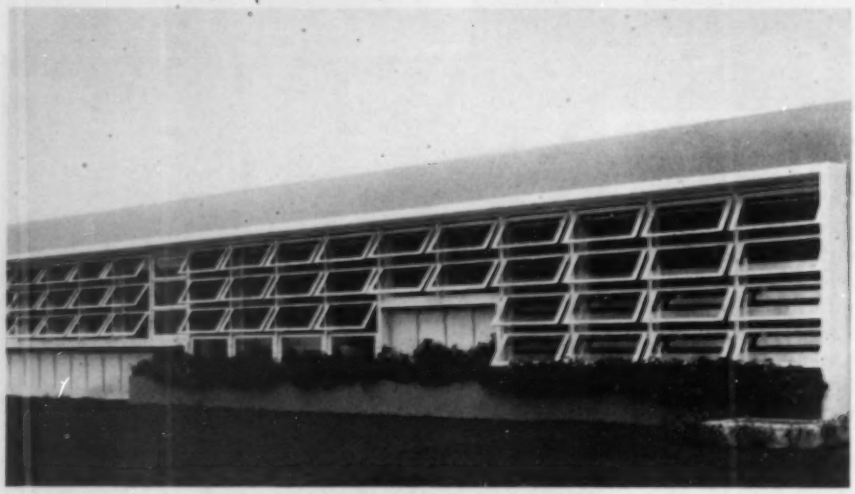
Wood Projected AWNING Type



Harbor Junior College, Los Angeles, Calif., J. R. Friend, AIA, & A. C. Zimmerman, AIA, Architects

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Dalmo Windows allow the use of venetian blinds or ordinary shades. The sash can be operated without disturbing blind or shade. Ordinary shades may be attached to the sash itself to control daylight illumination and give uniform light distribution without interfering with ventilation.

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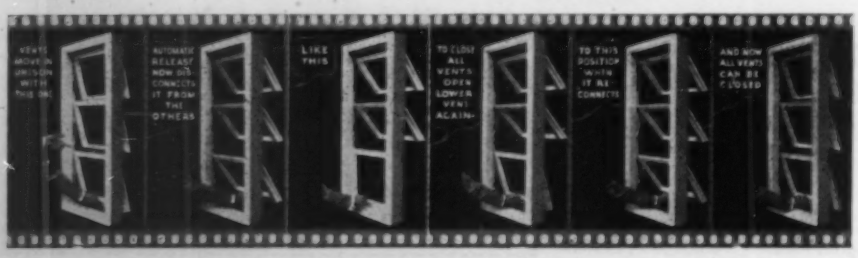

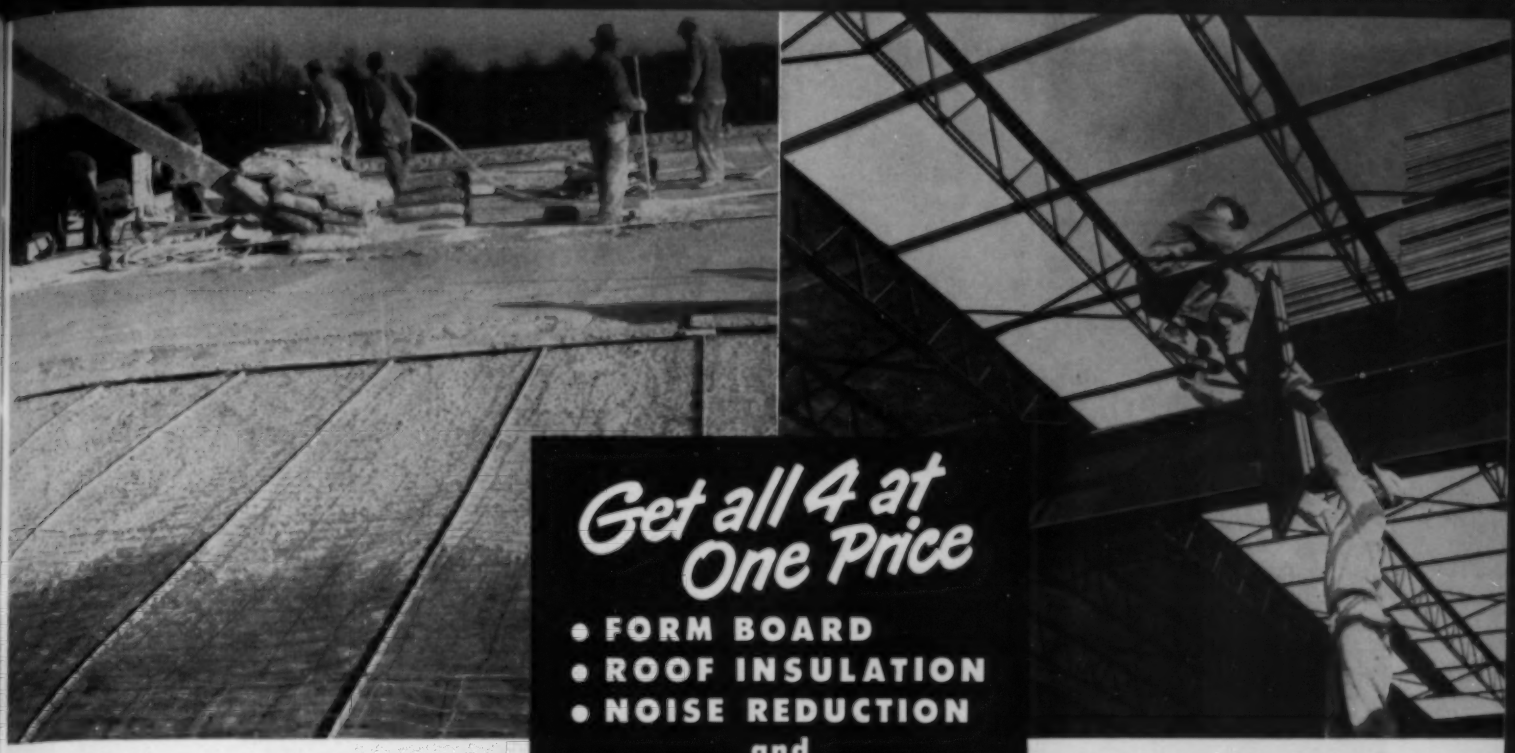

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ACOUSTICAL TREATMENT — Riverbank Laboratories' tests of assemblies composed of 2 inches of poured gypsum composite on Fiberglas Form Board show the noise reduction coefficient to be .75—as good or better than regular acoustical materials.

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BUILDING MATERIALS

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 (*Continued from page 168*)

prize. This team included Russell Glueck, architect; Dennis V. Wehmueller, landscape architect; Liz Fischer, sculptor; and Karl Walther Peterson, painter.

Six honorable mentions also were given.

Twenty-eight teams, representing 10 universities and art schools, took part in the competition. Members of the jury were: Kenneth K. Stowell, chairman; Philip C. Johnson and Walker O. Cain, architects; Robert McCloskey, painter; Mary Callery and Donald DeLue, sculptors; and Michael Rapuano, landscape architect.

• August J. Engler, a 21-year-old student at the Chicago Architectural Club, has been awarded first prize in a national design contest sponsored by the Beaux-Arts Institute of Design in cooperation with the Tile Council of America.

Mr. Engler and instructor, President Thomas Mulig of the Club, inspect his entry

Mr. Engler's design showed a wall of a flower shop finished in clay tile of a pale pink shade. Permanent display space for flowers and plants was used to lend interest to the design.

The contest, which was judged by 10 prominent New York architects, members of the Beaux-Arts Institute of Design, drew entries from 283 students in 11 architectural schools throughout the nation.

• Robert L. Williams of Stephenville, Tex., has received the $100 first prize in the Baker Grand Rapids Furniture Competition awarded through the Parsons School of Design, where he is a student.

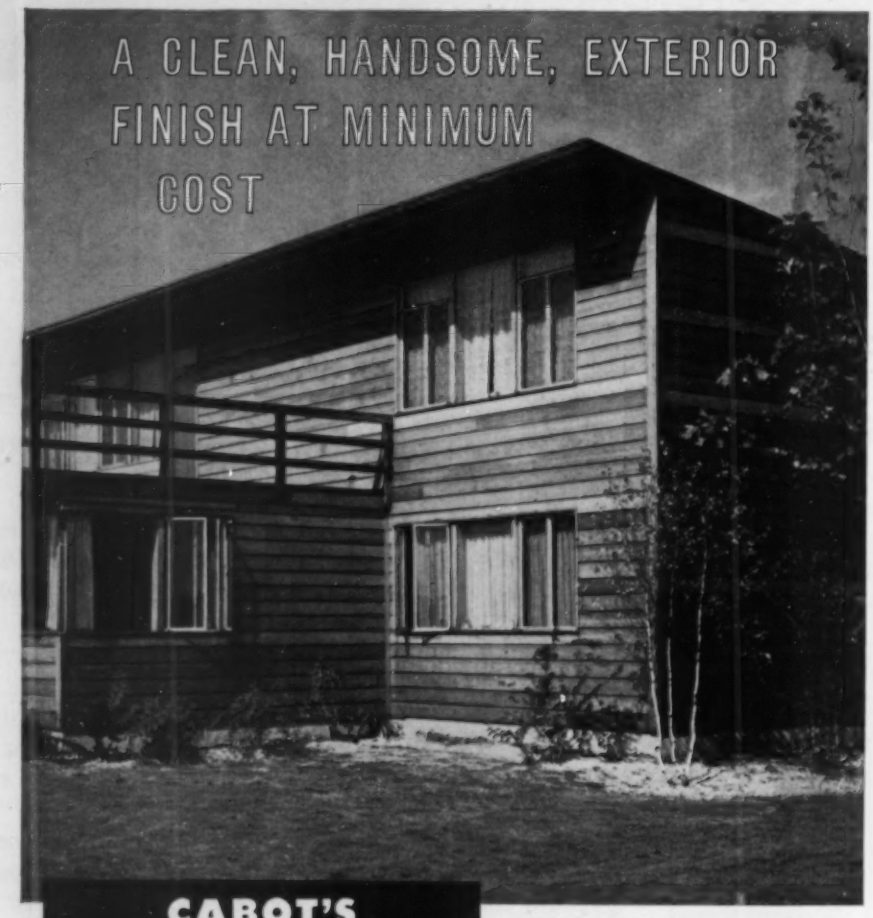
The competition was open to all students. The problem was design of a living-dining room for either town or country, based on three floor plans submitted by the Company.

• Dr. Richard K. Cook, chief of the sound section of the National Bureau of Standards, has received the Washington Academy of Science Award for distinguished scientific achievement in the engineering sciences by researchers under 40 years of age. Dr. Cook won the honor for his work in acoustics, particularly the development of an absolute method for calibrating microphones.

• Donald E. Babcock, metallurgical engineer, Republic Steel Corp., was awarded the American Iron and Steel Institute Medal at the 58th general meeting of the Institute. Mr. Babcock received the award for his paper on "Sulphur Control and Manganese Conservation in Open Hearth Furnaces," presented at the Institute meeting in 1949.

• James F. Lincoln, president of the Lincoln Electric Co., Cleveland, re-

(*Continued on page 172*)



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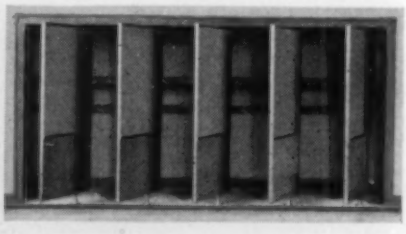

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1880 RICHARDS WILCOX R-W AURORA 1950
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THE RECORD REPORTS

(*Continued from page 170*)

ceived the honorary degree of Doctor of Science from Ohio State University last month. Mr. Lincoln is a Fellow of the American Institute of Electrical Engineers, member and director of the National Electrical Manufacturers Association, member of the American Welding Society, The American Society of Mechanical Engineers and the Cleveland Engineering Society. He is also a director and industrial counsellor of the Research Foundation of Ohio State. The James F. Lincoln Arc Welding Foundation was created in his honor.

AT THE COLLEGES

Architecture Now Becomes Separate School at Tulane

The Tulane School of Architecture has been established as a separate school of the university and Prof. Buford L. Pickens, head of the school since 1946, has been named director.

Prof. Pickens has expressed the belief that the separation of the school of architecture from the College of Engineering, instead of meaning less correlation, may make it possible to carry on an even more coordinated program than up to now.

Cincinnati Arts College Notes 25th Anniversary

Twenty-five years of education in the applied arts were marked at the College of Applied Arts at the University of Cincinnati last month. An anniversary banquet was held June 2.

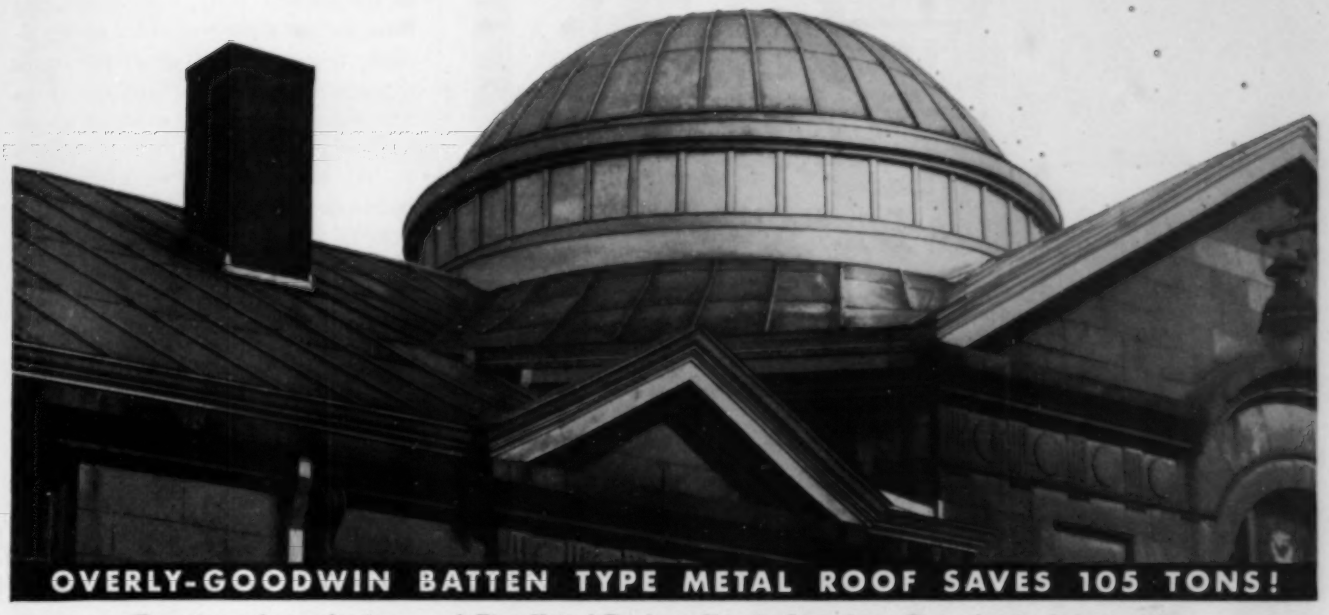
The College of Applied Arts, formerly the School of Applied Arts, was founded in 1925 by Dean Herman Schneider as an outgrowth of the already existing Department of Architecture. From the beginning, work in the applied arts has been given on both the full-time and cooperative basis. By means of carefully selected jobs, cooperative students alternate between school and work in an educational program combining theory and practice.

This cooperative system has been operating for the Department of Architecture since its inception. Each student is paired with an alternate; and while one is in school for a seven-week period, the other is working in a definite educational program of practical training.

(*Continued on page 174*)

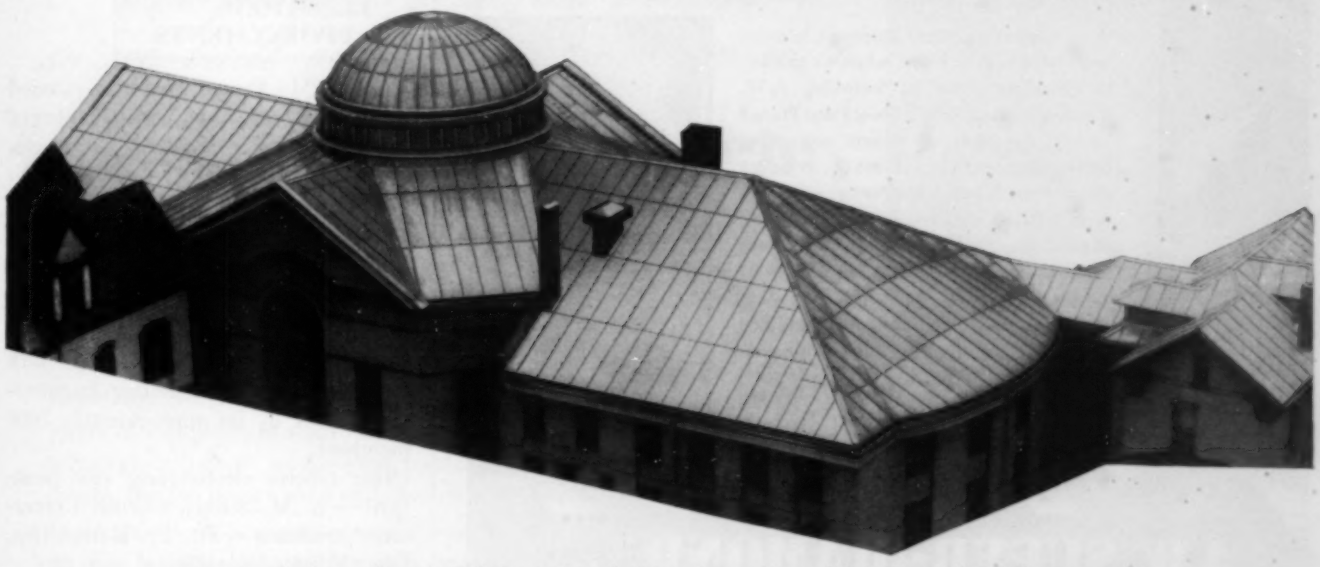
IF YOU LIGHTEN THE ROOF LOAD

YOU LENGTHEN THE LIFE OF THE BUILDING



OVERLY-GOODWIN BATTEN TYPE METAL ROOF SAVES 105 TONS!

Two views of new aluminum roof, First United Brethren Church, Greensburg, Pennsylvania. **By removing original heavy tile roofing, Overly reduced the load on the wooden trusses by 105 tons!** Splitting and sagging of the timbers, caused by the weight of the tile, was corrected and will never again be a problem. Aluminum roof now on church, Sunday school, and parsonage will be maintenance free for years to come.



Overly work shown above included complete design and execution of the following: reinforcement of sagging balcony; rebuilding vertical sides of dome; removal of skylight; covering entire roof with 20 gauge aluminum; furnishing and erecting new 16 gauge aluminum cornices, gutters, conductors, flashings, vertical paneling on dome, cornice frieze, and hanging gutters on Sunday school building.

Lighter weight design of Overly Metal Roofing (whether aluminum, copper, stainless steel, or monel metal) relieves stress on roof supports. This patented roofing can be installed on single and double pitched roofs, hip roofs, barreled roofs, and domes or wherever there is a pitch of at least 1½″ in 12″. Exclusive advantages are described in a four-page bulletin entitled, "Overly-Goodwin Batten Metal Roofing & Coping." **Send today for your copy.**

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A.W. SUPER-DIAMOND
FLOOR PLATE

FOOT SAFETY IN EVERY FOOT

Why risk having costly slipping accidents anywhere in your plant, when it's so easy to eliminate them by installing A.W. Super-Diamond Rolled Steel Floor Plate? Today hundreds of plants are using Super-Diamond Floor Plate . . . in boiler rooms—on shipping platforms—on floors and trucking aisles—on walkways and fire escapes. In fact, it is used wherever men walk or climb in plants and on products. Remember, too, it's easy to clean, requires no maintenance, and can be cut and installed overnight with minimum scrap.

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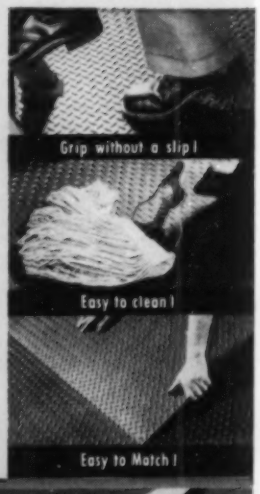

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Other Products: PERMACLAD Stainless Clad Steel • A. W. ALGRIP ABRASIVE Floor Plate Billets • Plates • Sheets • Strip • (Alloy and Special Grades).

THE RECORD REPORTS

(*Continued from page 172*)

This year 32 states are represented in the student body, and cooperating firms in many parts of the country include representatives of every aspect of the building industry. Last year architectural students were working on cooperative jobs in offices from New York to San Francisco and at intermediate points in the East and Middle West.

"The wide acceptance of this theory of training by architects throughout the United States," says Dean Ernest Pickering, "is, we believe, evidence of the soundness of this educational policy."

Robert C. Gaede Winner of Booth Traveling Fellowship

Robert C. Gaede of Cleveland, Ohio, has been awarded the George G. Booth Traveling Fellowship for 1950, the College of Architecture and Design of the University of Michigan has announced.

Mr. Gaede plans to travel in England and on the Continent.

ELECTIONS APPOINTMENTS

• Harry M. Prince has been named president of the New York Chapter of The American Institute of Architects. Other officers elected were: Geoffrey N. Lawford, vice president; Ralph Pomerance, treasurer; Alonzo Clark, secretary; and Francis Keally and Perry Coke Smith, executive committee.

• Walter Sturrock of General Electric Co., Cleveland has been elected the 46th president of the Illuminating Engineering Society by its approximately 7000 members.

Other officers elected are: vice president — E. M. Strong, Cornell University; treasurer — R. F. Hartenstein, Ohio Edison Co.; general secretary — A. H. Manwaring, Philadelphia Electrical & Mfg. Co.; directors — L. A. Hobbs, Smoot-Holman Co., Inglewood, Calif.; Roy A. Palmer, Duke Power Co.

New regional vice presidents will be: Great Lakes — F. C. Winkler, Westinghouse Electric Corp.; Midwestern — Charles N. Laupp, Wisconsin Electric Power Co.; Northeastern — R. G. Slauer, Sylvania Electric Products, Inc.; Pacific Northwest — K. E. Hollingsworth, Puget Sound Light & Power Co.; South Pacific Coast — C. O. Martin, Benjamin Electric Mfg. Co.

(*Continued on page 176*)

We practice what we preach—
so we built our new laboratories with

Architectural Concrete

For many years we have been telling architects, engineers, contractors and others about the advantages of building with architectural concrete. So when we planned buildings of our own—new research laboratories near Chicago—the natural choice was architectural concrete.

With more than 30 laboratories in two buildings (larger building shown above) requiring varying temperatures and humidity and many kinds of equipment; with dusty soil and aggregate handling facilities adjacent to offices and rooms containing delicate laboratory instruments, the job presented a real challenge to the architect and contractor.

Architectural concrete meets all the requirements for strength, rigidity and weathertightness in such buildings. And, like other architectural concrete structures, these laboratories have distinctive beauty, firesafety and the durability to deliver long years of service.

Architectural concrete is ideal for structures of any size or purpose—schools, factories, hospitals, office and apartment buildings. Its long life and low maintenance cost result in ***low-annual-cost*** service—the true measure of construction value. Such low-cost service is important to owners, investors and taxpayers alike.

For more information about architectural concrete write for free, illustrated literature. Distributed only in United States and Canada.

Larger of two architectural concrete buildings housing new PCA research and development laboratories is shown at top. Interior of main lobby is pictured above. The two buildings have a combined floor space of about 98,000 sq. ft. and required 7,300 cu. yd. of concrete. All exterior walls are of air-entrained concrete. Oregon fir forms created the board texture. All interior partitions are concrete masonry. The cast stone used in the lobby was made with granite aggregate. Carr & Wright were architects and engineers; The Turner Construction Company was contractor.

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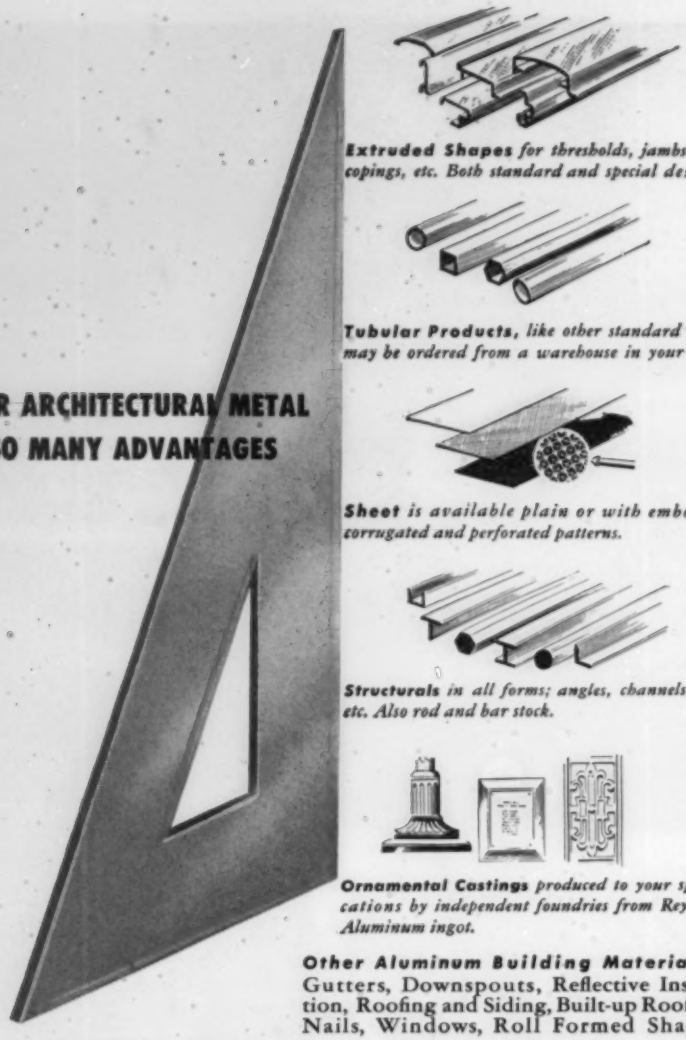
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work



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***Tubular Products**, like other standard items, may be ordered from a warehouse in your area.*

***Sheet** is available plain or with embossed, corrugated and perforated patterns.*

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REYNOLDS *Architectural* ALUMINUM

A COMPLETE ALUMINUM SERVICE TO ARCHITECTS AND FABRICATORS

THE RECORD REPORTS

CANADA

(*Continued from page 16*)

developments in North York near Toronto, at an estimated total cost of $5.7 million.

Quebec Province is to have a new million dollar hospital and a convent costing $1.2 million. A bridge near Quebec City is billed at $3.5 million. London, Ont., is starting on a livestock arena at a cost of $1.3 million.

The Maritimes, too, will share the rush of building activity. St. John, N.B., has a $1.8 million budget for dredging, while docks and terminal facilities are to be enlarged at North Sydney, N.S., for $1 million.

This partial analysis explains why, for the first time this year, all entries in the contract books were up for the month of April. Comparative figures with April 1949 follow:

Residential — 1950, $42,996,900; 1949, $36,351,700.

Commercial — 1950, $29,581,400; 1949, $23,097,000.

Industrial — 1950, $17,943,300; 1949, $2,656,100.

Engineering — 1950, $23,364,800; 1949, $14,689,600.

Public Works Rise Slightly; No Sign of "Pump Priming"

It is apparent from latest government announcements that Canada is not likely to prime the public works pump yet. In spite of general concern over last winter's unemployment figures, Ottawa is pursuing a middle way, with allocations for public buildings just 21 per cent over 1949.

This year over $32 million is being split up among the provinces. Ontario gets the lion's share of $10 million; Quebec comes second with $8.5 million; the West and the Northwest are down for $9 million, while the Maritimes and Newfoundland receive $4.9 million.

Engineering Institute Opens Annual Meeting on July 10th

The week of July 10th has been chosen by the Engineering Institute of Canada for its 64th annual conference.

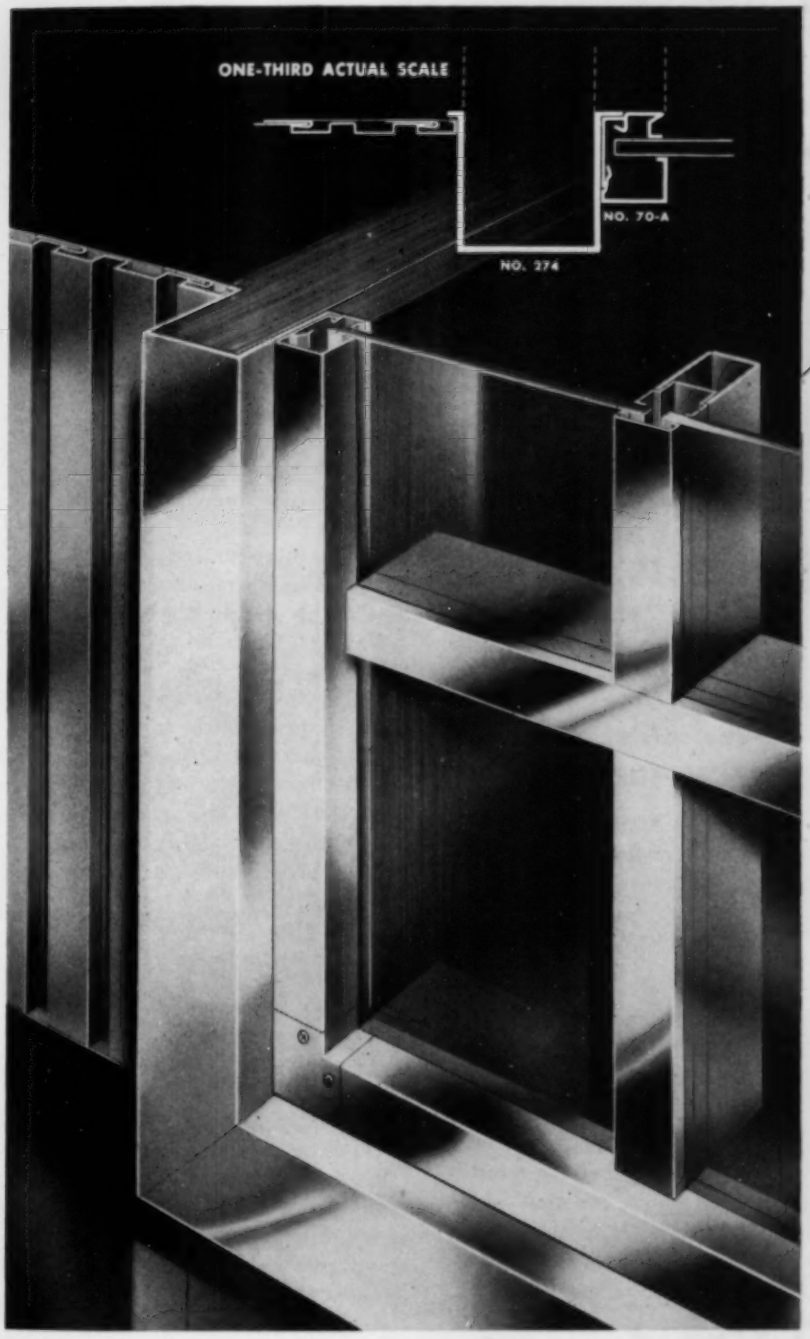
E. Ross Graydon, chairman of the Toronto branch, will be host to some

(*Continued on page 178*)

In line with modern design . . .

another *Projecting Frame*

IN PITTCO STORE FRONT METAL



● This assembly answers the need of some store front designs for a modern projecting frame to satisfy certain style requirements, and to give toe room and protection to the bulkhead.

The frame is formed by Pittco De Luxe Standard Moulding #274. This extruded Alumilite moulding may be combined with any sash in the Pittco line, but it is shown here, in conjunction with Premier Sash 70-A and No. 28 Bar. The pilaster is faced with mouldings in the Pittco Premier Moulding Kit.

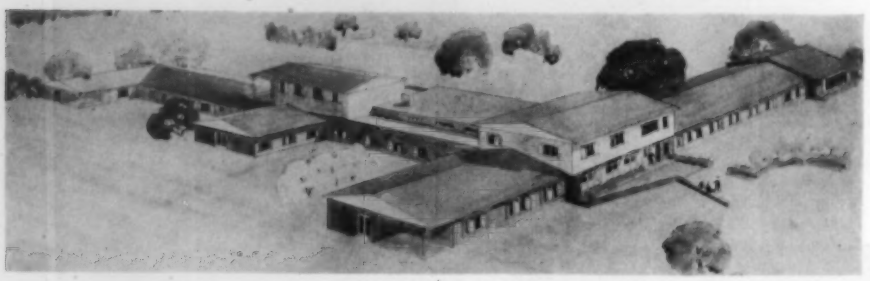
It is possible to work out a wide variety of sash, sill and moulding combinations, using both De Luxe and Premier standard members and the Pittco Premier Moulding Kit. Why not examine the Pittco Metal Sample Case? A representative from our nearest office will gladly call and display it.

PITTCO STORE FRONT METAL

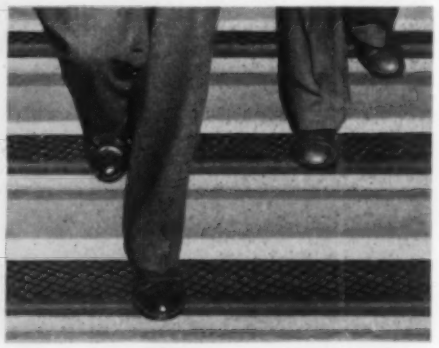
PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

CANADA (*Cont. from page 176*)



Home for Aged, Fort Frances, Ont. (photo of rendering above) will have reinforced concrete foundation, concrete slab on fill. Architects are Rounthwaite and Fairfield, Toronto



SMOOTH NOSINGS ARE dangerous FOR down TRAFFIC!

Specify FERALUN*—the safety tread with abrasive IN THE NOSING SURFACE

As the illustrations show, DOWN traffic needs the underfoot "grip" of abrasive particles embedded in tread nosings, to prevent slipping and wear. UP traffic needs the same safety features.

Feralun treads are made to provide full protection from this "double traffic" all stairways must serve. They always have abrasive granules in the nosings —for the *down* traffic, and should be wide enough (at least 4") to protect the *up* traffic as well. *Note action photos showing points of foot contact which are also points of slipping and wear.*

Not only do these sturdy cast iron abrasive treads give underfoot safety *up* and *down*, but they also give protection from wear as well. Installations of Feralun treads are still giving maintenance-free safety after more than a quarter century of continuous use.

For full information on Feralun and other underfoot safety products, see Sweet's File, Architectural, Sec. 13a/10, or write to:

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USE FERALUN TREADS AND BE SAFE . . . "DOWN AND UP"

1200 delegates at Toronto's Royal York Hotel.

President John E. Armstrong, Canadian Pacific Railroad chief engineer, will preside over business sessions and at the windup dinner and dance on Friday, July 14, will introduce the new president, James A. Vance. Mr. Vance is an industrialist and contractor of Woodstock, Ont.

Toronto Architects Elect; More Competitions Urged

George Gibson was named chairman of the Toronto Chapter of the Ontario Institute of Architects at the chapter's recent annual meeting.

Other new officers are: J. F. Brennan, vice chairman; E. C. S. Cox, John C. Parkin, J. B. Langley and William A. Mollard, members of the executive committee. Earle L. Sheppard continues to represent the O.A.A. and John D. Miller remains as secretary.

Assembled architects heard E. W. Haldenby declare that holding competitions for the design of important public buildings is the way to help young architects establish themselves.

"In cases where, despite the cleverness of his design, the winner might lack practical experience," Mr. Haldenby suggested, "he could associate himself with an older architectural firm for the duration of the work."

Mr. Haldenby, a partner in the well-known firm of Mathers & Haldenby, heads the chapter's committee on public buildings.

Architects, Client View: Businessmen Speak Up

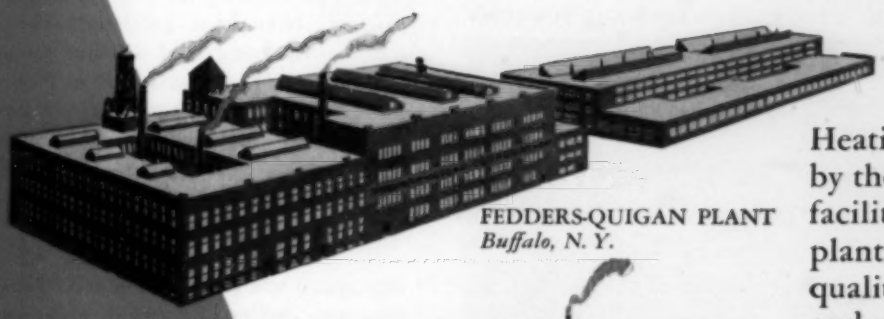
Many of the architect's most hoped-for clients are executives in industry and commerce. Mindful of this fact, the Ontario Association of Architects recently commissioned a public opinion research firm to report on their knowledge of and attitude towards the profession. The survey included 500 completed interviews among businessmen of all ages in the upper and middle income groups in Ottawa, Toronto, Hamilton, London and Windsor. The distribution of respondents was in direct proportion to populations of these cities.

Results of the survey were gratifying in some respects, alarming in others. On the credit side, almost all respondents (94.8 per cent) knew that architects

(*Continued on page 180*)

fedders

MAKES HEATING EQUIPMENT IN 4 PLANTS



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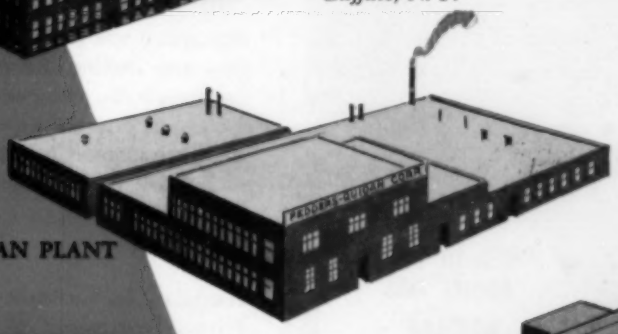
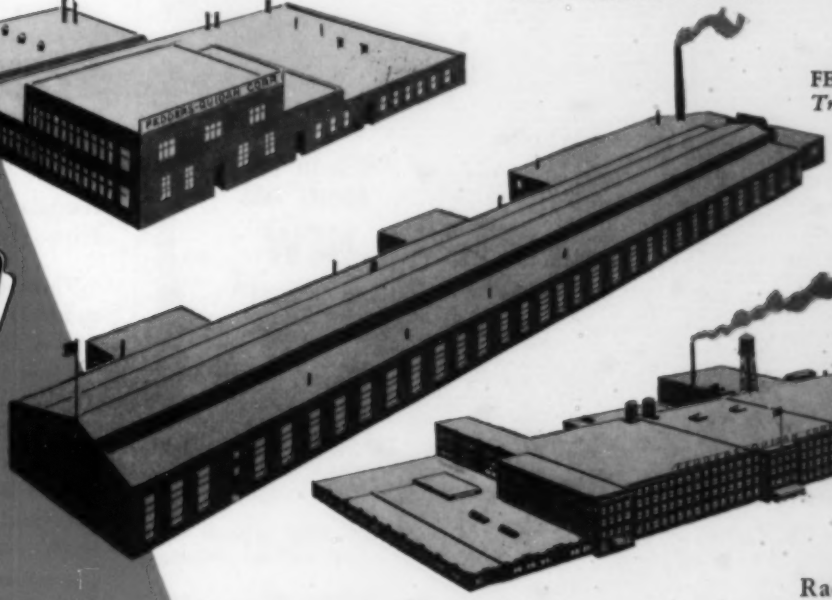
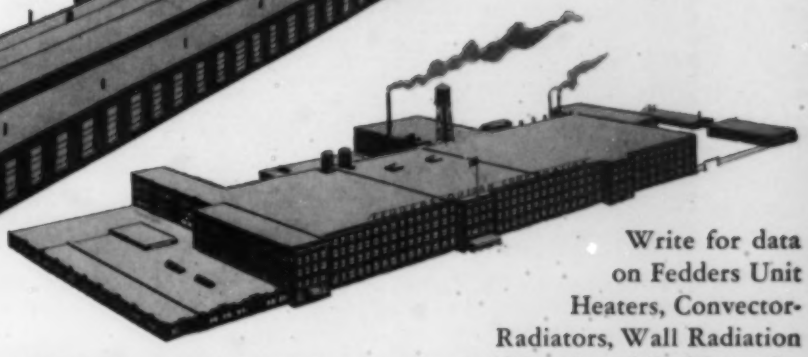


FEDDERS-QUIGAN PLANT
Maspeth, N. Y.

FEDDERS-QUIGAN PLANT
Trenton, N. J.





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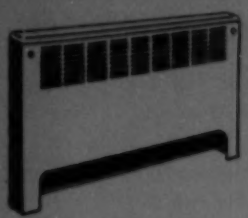

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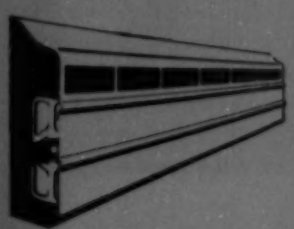

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Baseboard Radiation

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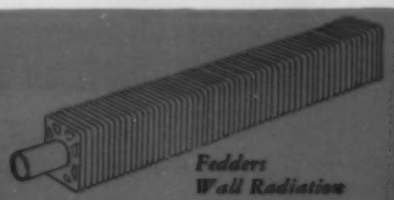
Unit Heaters



Fedders
Wall Radiation

CANADA (*Cont. from page 178*)

"drew plans, designed buildings and had blueprints prepared." Less than one per cent were unable to name any service performed by architects. One of every six respondents had employed an architect in the past, older men and those in the upper income group having done so most frequently. A few complained that the architect charged too much; but the vast majority (92.6 per cent) expressed themselves as being well satisfied with his professional services.

On the other hand, the survey revealed that only 70.8 per cent would engage an architect for a new building. Here again, there was evidence of a higher regard for the profession on the part of older men and men in the upper income group. Those who indicated they would not employ an architect said they would use their own plans and ask a contractor to prepare them.

Additional debit results were these:

One quarter of the respondents did not know that the architect is paid by his client. Most of the respondents in this category thought the contractor paid him.

One third (chiefly the younger, middle-income element) said they regarded architecture as a business rather than a profession.

Two thirds were unaware that the architect supervises the construction of buildings. The same proportion had an inaccurate idea of the cost of his services.

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FOR UTMOST ATTRACTIVENESS, STRENGTH, LOW MAINTENANCE AND ECONOMY

APPLICATION: For all types of commercial, public and private buildings, schools and institutions where sections of buildings or areas are to be closed off without shutting out light and vision.

ADVANTAGES: MECCO proven quality of workmanship in new MECCO design grille that is stronger and more attractive than usual types. New simplicity of design lowers maintenance. Guides may be concealed. Arranged for easy manual or hand chain or crank operation. Cylinder-type lock or padlock locking available. Write for complete details. Also made to specification.

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First Official Figures for 1950 Show January Housing Drop

First official government figures on residential building for 1950, covering January, have been published. They estimate the number of dwelling units started at 2152, including 103 in Newfoundland. The comparable figure for January 1949 was 3066 units.

Completions for January 1950 are estimated at 6480. For the same month last year completions totaled 6643.

Of the dwelling units being constructed, it was found that about 22 per cent were destined for rental, while the rest were to be owner occupied.

According to the survey it still takes the same amount of time, 6.8 months, to build a dwelling unit as it did in January 1949.

Housing in Canada *Gives Summary of 1949 Picture*

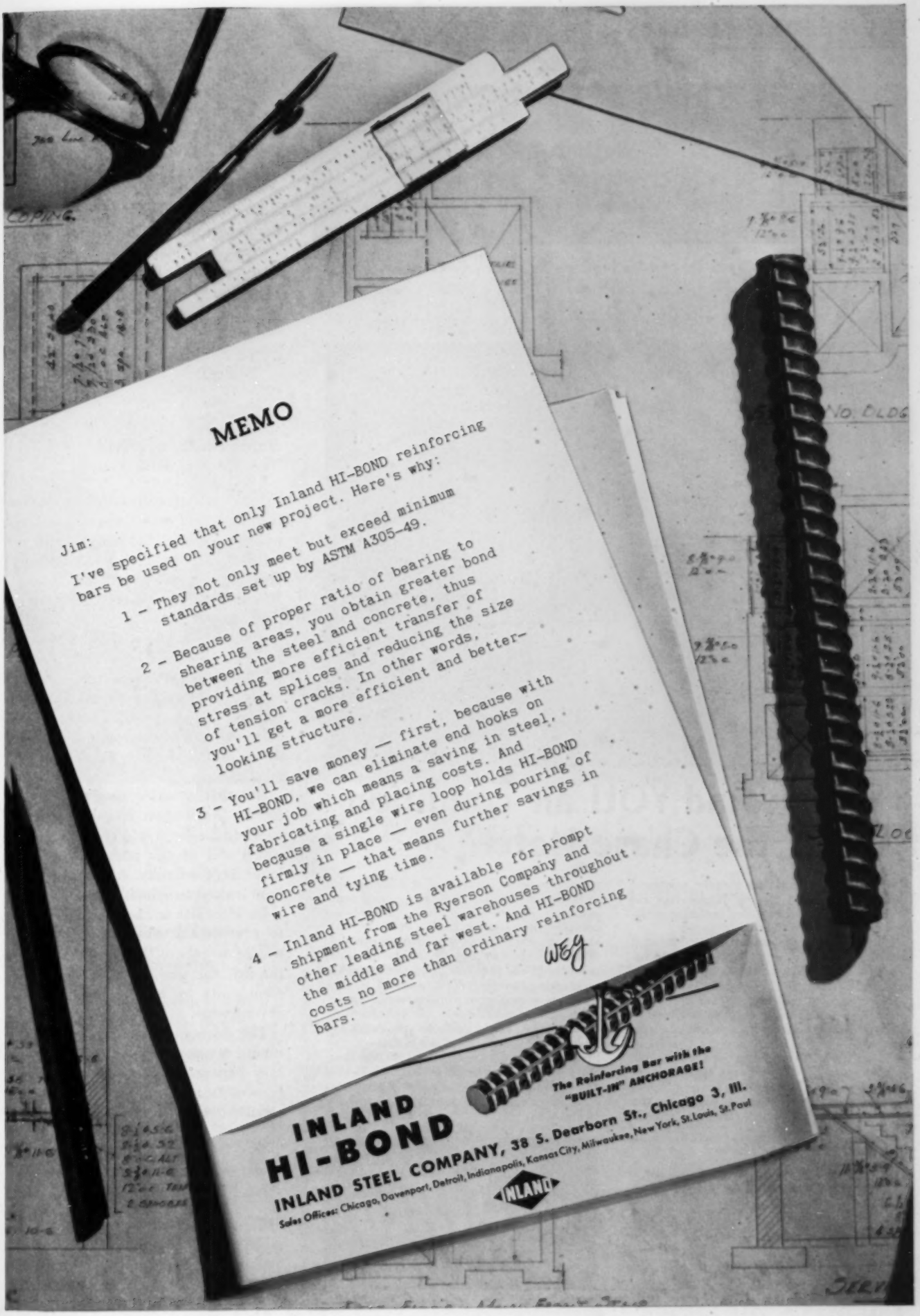
The latest issue of *Housing in Canada*, quarterly publication of Central Mortgage & Housing Corp., reveals that for the first time since the war's end, new houses completed in 1949 outnumbered new families formed by about 11,000.

Completions reached a record 91,000 (35,000 being government-assisted construction); but starts leveled off at 93,000, about 2000 less than in 1948. Conversions showed a similar drop of some 2000 units.

Lending operations under the National Housing Act amounted to over $160 million in 1949, involving 28,800 dwellings. The Rental Insurance Plan which was passed in 1948 came into its own. Gross loans were okayed on 9000 rental units — double the 1948 number. Approved home ownership loans under the Integrated Plan accounted for 19,800 units — 2400 more than in 1948.

The report shows a new and hopeful

(*Continued on page 182*)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INLAND

CANADA (*Cont. from page 180*)

Parrott, Tambling & Wilmer, Toronto, are architects for Loblaw Groceterias Co.'s store and office building at Sudbury, Ont. (above). K. W. Bash is Loblaw's chief engineer

How would YOU air condition the Chase Hotel?

Here's a problem that nearly stumped the experts. How to get large-scale air conditioning in an existing building without ripping out walls for ductwork.

The Chase management looked over a lot of systems . . . and settled on Modu-aire. usAIRco Modu-aire is an air conditioning system that provides individual room control of heating or cooling. Small copper tubing carries ready-made weather from a central system to each Modu-aire unit. Simple dial control gives the room occupant perfect comfort in all seasons.

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The Modu-aire system offers an ideal solution to the problem of air conditioning an existing building. You can see too, how Modu-aire will give you outstanding results in any multi-room air conditioning installation you may be planning . . . whether for new or existing buildings. It's luxury air conditioning . . . in all but cost. Why not look into usAIRco Modu-aire soon! Wire or write United States Air Conditioning Corporation, Minneapolis 14, Minnesota.

Engineers and manufacturers of air conditioning, refrigeration, unit heaters, coils and ventilating equipment

stability in material and labor costs. The wholesale price index of house construction materials dropped one per cent, the average hourly wage rates of workers increased four per cent.

More men worked in the construction industry in 1949. As of October, the industry employed a record labor force of 329,000 — 12,000 more than in 1948.

Production output of building materials registered a general gain, though certain items suffered a drop. Biggest increases came in the production of tubes and fittings, rock wool, sinks and steel pipe. Declines in production of cast iron radiators and heating boilers were attributed to higher costs, scarcity of installation pipe, and a trend to warm air systems.

Home Builders Pledge New Record This Year

Builders are constructing more houses than ever, and expect to ride the boom well into 1952 — but they're still not satisfied. At their recent convention in Winnipeg, members of the National House Builders' Association declared they would set a new construction record this year. That gives them something to beat, with the 1949 mark of 91,000 new houses built.

The dissatisfaction stems from the builders' feeling that they haven't made an all-out attempt to provide a cheap, well-constructed house for the working man.

But that situation may change fast, for the Association is now running a competition for a $1000-a-room house which will fit the pocketbook of the lower-income family. All builders have been invited to submit plans.

Builders look to the amended N.H.A. to provide the serviced land that is needed to relieve the present shortage, through the sharing of land improvement costs by federal and provincial governments.

The Association passed a resolution urging revision of the municipal taxation system, and recommended that housing taxation should be confined to services directly related to housing.

Mortgage Lending Reached New $1 Billion High in '49

That villain of many an old-time mellerdrama, Simon Legree, was thoroughly hissed every time he appeared waving a mortgage in his fist. But he's

(*Continued on page 184*)

NOW...

The beauty of KENCORK

at lower cost than ever before

New 3/16" gauge KENCORK costs less than wall-to-wall broadloom

News for Small Home Developments

• Now you can suggest this luxury floor for use in low cost home developments . . . for the first time offering a truly outstanding flooring at very little extra cost. Architects' specifications carrying this recommendation may provide the exact *home-selling* feature that new "merchant-builders" and contractors are looking for.

NOW YOU CAN OFFER your clients wonderful Kencork's many advantages at lower prices than ever before! This resilient flooring does the work of floor and carpeting alike . . . rich nut-brown cork tiles offer restful, quiet comfort underfoot . . . provide a perfect flooring that won't wear out through years of use. Staining liquids that permanently damage carpeting can be easily wiped off Kencork. Kencork insulates floors against heat and cold . . . is ideal for use with radiant heating panels. Specify this new gauge Kencork for every installation where *practical luxury* is your client's first requirement.

Specify Kencork Walls in new 3/16" gauge, too. Your clients will be delighted with this distinctive, luxury wall treatment at the new lower cost.

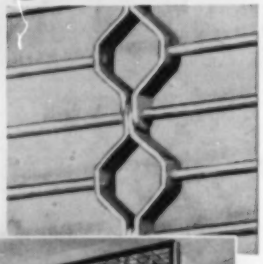
KENCORK
FLOORS
WALLS

DAVID E. KENNEDY, INC., 58 Second Avenue, Brooklyn 15, N. Y.

RESILIENT FLOORING FOR OVER FIFTY YEARS... KENTILE • RUBBER TILE • KENCORK

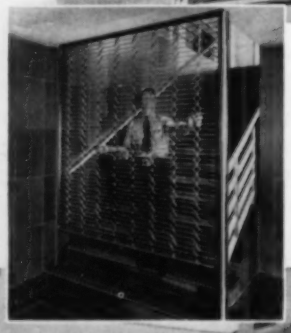
CONVENIENT
ATTRACTIVE
ALL-STEEL
Protection
that doesn't cut off light, air or vision

Kinnear Steel Rolling Grilles
For Windows, Doorways, Corridors



This all-metal barricade guards any opening with a curtain of rugged steel rounds and links. Yet it doesn't cut off light, doesn't block vision, doesn't impede ventilation. It can be lowered into place or raised out of the way in a matter of seconds! It offers convenient protection without loss of architectural beauty. As the pictures here testify, it's the ideal way to prevent trespassing in areas where the public assembles, or wherever it is desirable to block off certain sections of a building.

Kinnear Rolling Grilles open straight upward and coil into a small, out-of-the-way space above the opening. No usable floor or wall space is wasted. In many installations, the mechanism on which the Grilles coil when opened can be concealed within the lintel construction.



Kinnear Rolling Grilles are made to fit any size window, doorway, corridor, stair-well, elevator shaft or other opening. They can be equipped to operate manually, mechanically (by chain or crank) or electrically. Easily installed in old or new buildings. Write for complete details.

The KINNEAR Manufacturing Co.
FACTORIES: 1860-80 Fields Ave. — Columbus 16, Ohio
1742 Yosemite Avenue — San Francisco 24, California
Offices and Agents in All Principal Cities

KINNEAR
ROLLING GRILLES

CANADA

(*Continued from page 182*)

changed a lot. Today, lending institutions of every type have a vital role in the task of aiding Canadian housing. Thanks to their loans, many a Canadian family, unable to shoulder the costs alone, enjoys the advantages of home ownership.

In 1949 lending institutions had loans totaling $1 billion invested in real estate. This is a new high, building up since 1939, when mortgage loans totaled $676 million.

Last year gross mortgage loans okayed by lending institutions numbered 62,000, involving $393 million — a 9 per cent increase over 1948. These figures come from a report on real estate financing ("Mortgage Lending in Canada, 1949") released by Central Mortgage and Housing Corp.

What lies behind this expanding activity? Experts explain by pointing to the increased scope of N.H.A., the higher yield on mortgage investments compared with other securities, and the continued health of Canadian economy. They predict that next year the figures will sharply increase.

Breaking down the totals, the survey discloses that of every five dwellings built in 1949, two were financed largely through loans from lending institutions; two were built on government account, or completed with government financial help; and one was built by an owner dependent on his own savings.

The report also offers interesting sidelights on residential financing. The average dwelling built under the Integrated Plan (whereby the government guarantees the sales price if the builder previously agrees to it as being "fair and reasonable") cost $7700 last year, or 12 per cent more than in 1948. While sales prices showed a general increase, purchasers required smaller down payments. At the same time, more people turned to second mortgages and personal loans to finance houses, the report reveals.

Government Plans Inspection Of N.H.A.-Financed Building

After a lot of time and talk, the home buyer is finally getting some real protection. Thanks to a recent government

(*Continued on page 186*)

This is York's advice to Your Clients:

York gives you unequaled support in providing the finest central station systems possible through this Nine-Point Plan . . .

- a complete line of equipment
- competitive prices
- accurate, dependable product ratings
- technical assistance based on "case histories"
- cooperation with architects, engineers and contractors
- practical help from York-trained engineers
- a national organization
- continuous product research and development
- certified maintenance

York believes that channeling contract work through you is the soundest method of assuring better air conditioning for your clients.

That's why a York-trained air conditioning and refrigeration engineer is available to work with you from the "idea" to the final installation phases of any of your jobs.

Beyond doubt his experience-sharpened, specialized knowledge will save you hours of tedious "desk- and drafting-time" in preliminary planning and specifications work.

Behind the technical counsel of the York engineer lie thousands of successful York installations in every type of business and industry, *plus* a *thorough* knowledge of York's complete line of refrigeration and air conditioning products.

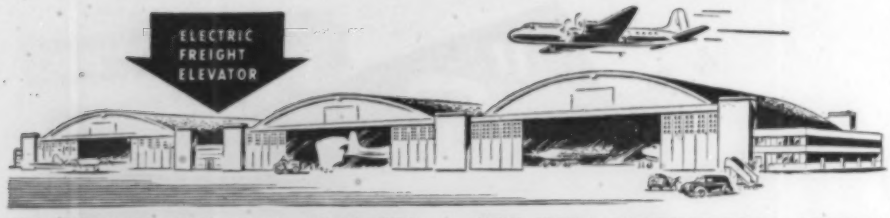
But more—to save you from post-installation headaches and time-consuming chores, York offers its Certified Maintenance Plan. A unique service that assures over-the-years continuous operating efficiency and peak installation performance—at costs that are determined in advance.

The York-trained engineer is able, fully qualified. And York products are backed by seventy-five years of production know-how and engineering advances. Check with your nearest York District Office to save time in design and detail work on your next tough job. York Corporation, York, Pa.

York refrigeration air conditioning

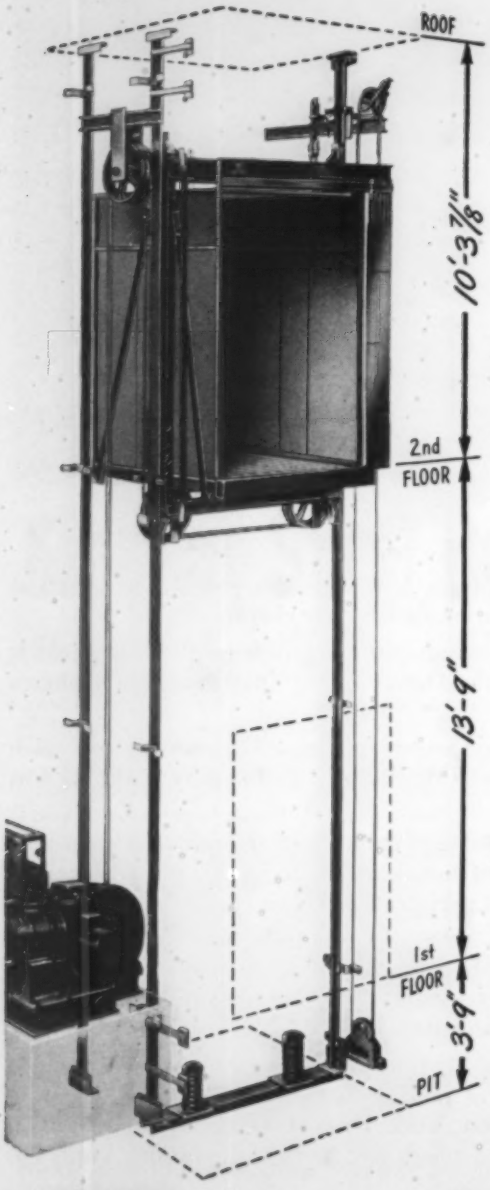
The big advances come from YORK

Headquarters for— **Refrigeration and Air Conditioning**



THE PORT OF NEW YORK AUTHORITY • NEW YORK INTERNATIONAL AIRPORT

Fits into 10'-3⅞" Headroom



Electric Freight Elevator Requires No Penthouse

Freight elevator service was required for the 2nd floor cafeteria and kitchen in the West Center Lean-to between newly built Hangars 3 and 4 at New York International Airport. Lean-to design set concrete roof beams 10'-3⅞" above the second floor. Hangar steel prevented a break-through for a penthouse. At the 1st floor, water existed approximately 4 feet below the grade level. In all, a tight squeeze for an elevator installation.

But not difficult for a standard Otis Self-Supporting Freight Elevator. As illustrated, the installation stops at the under side of the roof. *No penthouse is required.* Guide rail connections at each floor and the roof take care of light horizontal thrusts. *No overhead supports are required.* The guide rail structure transfers all vertical loads to the bottom of the pit. *No building reinforcing is necessary.*

Otis Self-Supporting Freight Elevators have 1,500, 2,000 and 2,500 lb. lifting capacities. Any rise up to 35' 0" —sufficient for a 3 story building. Speed is 25 feet a minute. Write for Booklet B-720-F or phone your Otis office. Otis Elevator Company, 260 11th Avenue, New York 1, N. Y.

ELECTRIC
FREIGHT ELEVATORS

SELF-SUPPORTING • POW-R-TRUCK • GENERAL PURPOSE

THE RECORD REPORTS

CANADA

(*Continued from page 184*)

announcement, chances are he'll rarely lose his down payment to some irresponsible builder, or get stuck with a badly constructed house.

Building contractors who operate under N.H.A. can expect a call from a crack inspection corps every so often. These experts will check construction from the turning of the first sod to the laying of the last shingle. As well, they will inquire into the financial and credit standing of every contractor.

No specific N.H.A. guarantee will be given the purchaser; he's still expected to investigate before he invests. But he will have the assurance that periodic policing will do away with the old complaints.

Bossing the investigation corps will be Central Mortgage & Housing Corp. and cooperating insurance companies. As added protection, the announcement states that builders will not be allowed to work on more than 10 dwellings at a time.

National Building Code Revisions Are Under Way

Canada's National Building Code is being brought in step with the times.

Robert F. Legget, spokesman for the Associate Committee working on the Code, recently informed building leaders at their annual conference in Ottawa that important changes are coming.

Mr. Legget, who is director of the National Research Council's Building Research Division, explained that technical improvements and advances will get their just due under the modernized Code. Even the language is to be streamlined.

At present more than 150 municipalities make use of Code releases; some 30 have adopted them outright as local building codes.

Also discussed at the conference was a project calling for a national network of training schools where basic and brush-up courses would be available to local building inspectors. Up-to-date instruction, it was felt, could do a lot to speed acceptance of sound, money-saving improvements.

Some areas are getting around the present law by granting special waivers,

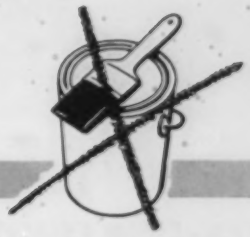
(*Continued on page 188*)

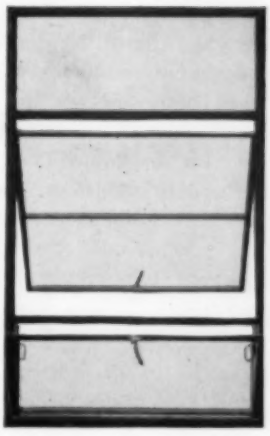
Announcing the Special

Fenestra Hot-Dip Galvanizing Process

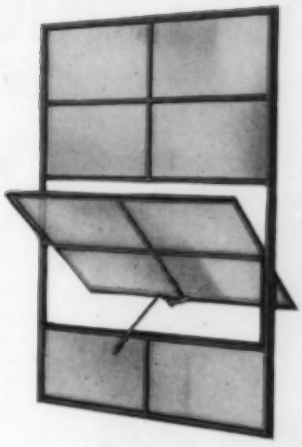
FOR MAINTENANCE-FREE

Steel Windows

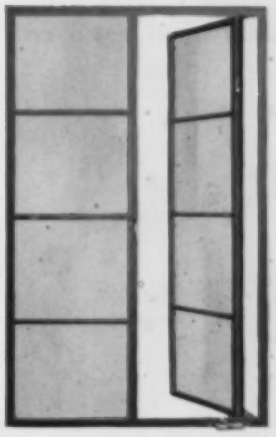




Intermediate Steel Windows



Industrial Steel Windows



Residential Steel Windows

Available soon from Fenestra's New Galvanizing Plant

Special equipment! Special technique! Complete quality control by highly skilled craftsmen of America's oldest and largest steel window manufacturer—Fenestra*!

Hot-dip, keyed-in galvanizing—*after fabrication! No* metal left unprotected!

These maintenance-free Fenestra Steel Windows are built of fine-quality hot-rolled steel sections . . . then specially hot-dip galvanized . . . then Bonderized for a perfect finish (as well as for an excellent base for a decorative paint-finish when desired)! *®

DETROIT STEEL PRODUCTS COMPANY, Dept. AR-7, 2252 East Grand Blvd., Detroit 11, Michigan

STEEL-STRONG WINDOWS MADE TO *STAY* NEW

Fenestra

Hot-dip Galvanized Steel Windows

CANADA (*Cont. from page 186*)

Proposed high school (left) at Espanola, Ont., for which F. W. Warren of Hamilton is architect, will have three standard classrooms; art, commercial and home economics quarters; library; general shop and science classrooms; lunch room; kitchen; combined auditorium and gymnasium with stage. Walls are masonry

ONLY MARLO COOLING UNITS ARE DOUBLY-PROTECTED AGAINST CORROSION

...Outside and Inside

Marlo Evaporative Condenser

Marlo Evaporative Condensers and Cooling Towers offer this big four-way defense against corrosion:

OUTSIDE — over the Hot Dip Galvanizing — Marlo all-steel housings are sprayed with a special rust-inhibiting alkyd resin-base paint that forms an *extra* front line barrier against corrosive elements.

INSIDE EACH UNIT — sheets, panels and galvanized parts are coated with a sound deadening *asbestos-asphalt mastic* that doubles as an efficient corrosion retardant. Additional internal protection is afforded by Marlo's exclusive "Lektro-Tektor" that *prevents electrolytic sump tank corrosion.*

• *Specify Marlo Cooling Units for your buildings . . . assure dependable, longer-lasting installations.*

MARLO HEAT TRANSFER Since 1935

25 Years

Write for complete information on Marlo Evaporative Condensers and Cooling Towers.

Marlo COIL CO. • 6135 Manchester Rd. • St. Louis 10, Mo.

and it's believed this method will continue while the Code is being modernized — a job that's expected to take two years.

Architecture as a Career Discussed in New Booklet

The Department of Labour, Ottawa, has published an interesting booklet "Careers in Natural Science and Engineering," containing its series of releases on Canadian occupations.

Monograph 21 deals with architects, and furnishes an excellent guide for anyone contemplating entering the profession as a lifework.

Some little-known facts are revealed. For instance, about 40 per cent of Canadian architects are 60 years of age or older, and fewer than 25 per cent are under 40. Almost 80 per cent of all architects in Canada live in Ontario and Quebec, and very few are located in cities of under 30,000 population.

Here's a breakdown of their occupational distribution: private practice, 50 per cent; building and construction, 25 per cent; manufacturing industries, 15 per cent; public works departments, 10 per cent.

"Just Bring an Honest Face"

Now it's home improvements you can buy on credit. You receive $2000 worth of credit, your home gets a face-lifting, and you have up to two years to pay.

The idea comes from out of the west — from Secretary-Manager Maurice Dix of B. C. Lumber Survey and the National Retail Lumbermen's Council of Canada, to be exact.

Mr. Dix, in announcing the new financing scheme, said that a company to advance home improvement credit is being organized through Dominion incorporation with $1 million capital.

Architect Presides Over Construction of — Table!

A. K. Mills, chief architect of the Department of Public Works, Ottawa, has been supervising the construction of — of all things — a *table.*

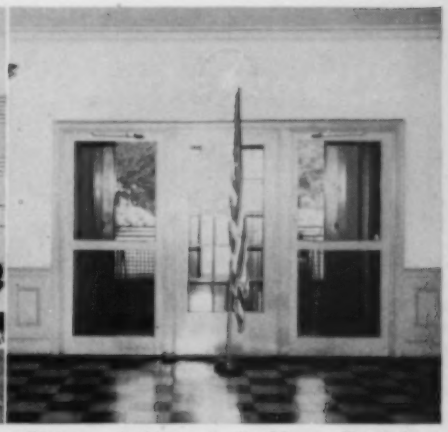
But no ordinary table, this! It's a 14-ft, paneled oak job that contains a modern air conditioning system for Britain's rebuilt House of Commons. It will be placed directly in front of the Speaker, as a gift from Canada.

The architect responsible for its design was none other than Sir Giles Gilbert Scott.

(*Continued on page 190*)

A total of 2200 Roddiscraft Solid-Core Flush Veneered Doors are in use at the United States Navy Medical Center in Bethesda, Maryland.

Roddiscraft Solid-Core Flush Veneered Doors are included in the permanent equipment of the modern Mercy Hospital in Rockville Centre, New York.



The new building of the Nassau Hospital, Mineola, New York, has Roddiscraft Solid-Core Flush Veneered Doors throughout.

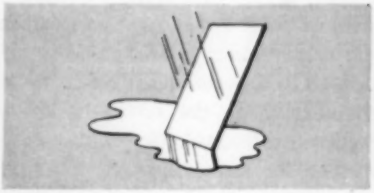
Roddiscraft

SOLID-CORE FLUSH VENEERED DOORS PROVED IN HOSPITAL SERVICE

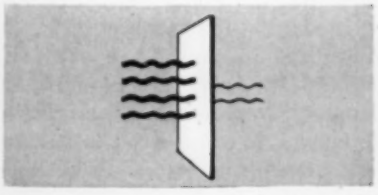
5 reasons why it pays to include these quality doors in your hospital construction plans

Identification and Guarantee—All Roddiscraft Solid-Core Flush Veneered Doors are guaranteed without qualification as to workmanship and materials. Inserted in the hinge rail of every door is a red, white, and blue dowel which permanently identifies the door.

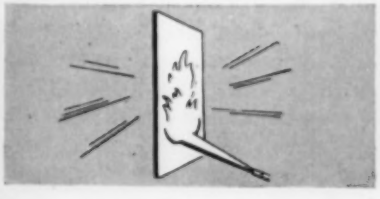
Resistance to Abuse—Roddiscraft Solid-Core Flush Veneered Doors easily withstand the punishment of heavy hospital duty. The entire door assembly is welded into a solid unit—permanently puncture-proof, waterproof, and resistant to decay.



Standard Thickness Face Veneers—Roddiscraft Standard Construction is a feature which adds to the durability of these Flush Veneered Doors. The Roddiscraft method utilizes Standard Thickness Face Veneers—as opposed to ⅛" and thicker veneers. Less moisture penetration — greater durability.



Sound Resistance—The high resistance of Roddiscraft solid-core construction to the passage of sound has been established by independently conducted laboratory tests. The standard 1¾" Roddiscraft Solid-Core Flush Veneered Door develops an average sound transmission loss of 30.9 decibels.



Fire Resistance—One reason why Roddiscraft Solid-Core Flush Veneered Doors are ideal for hospitals is their exceptional resistance to fire. This fact has been established by independent laboratories, where standard Roddiscraft doors exceeded the 40-minute fire test.

Both from the standpoint of utility and safety, Roddiscraft Solid-Core Flush Veneered Doors measure up to the stringent requirements of hospital planners. The service record of these exceptional doors stands as proof in itself. Every day—in new hospitals and old — Roddiscraft Solid-Core Flush Veneered Doors are providing dependable, satisfactory service. It's no wonder that more and more hospitals are turning to Roddiscraft for their doors.

Write for book —"An Open and Shut Case for the Finest Flush Doors" —giving complete details and specifications of the Roddiscraft Door line.

Roddiscraft

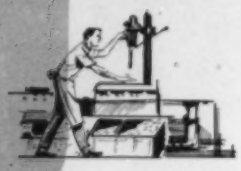
RODDIS PLYWOOD CORPORATION

MARSHFIELD, WISCONSIN

Warehouses in

Cambridge, Mass.	Houston, Texas	New York, N. Y.
Charlotte, N. C.	Kansas City, Kansas	Port Newark, N. J.
Chicago, Ill.	L. I. City, N. Y.	Philadelphia, Pa.
Cincinnati, Ohio	Los Angeles, Calif.	St. Louis, Mo.
Dallas, Texas	Louisville, Ky.	San Antonio, Texas
Detroit, Mich.	Marshfield, Wis.	San Francisco, Calif.
	Milwaukee, Wis.	

SUPER MARKETS



FACTORIES

for the tough jobs

HOTEL LOBBIES

DEPARTMENT STORES

your best floor is WRIGHTFLOR

Developed specifically for the heavy traffic areas, WRIGHTFLOR has characteristics which make it far superior to any softer rubber floor covering.

It's easy to clean! Extra-hard, non-porous WRIGHTFLOR needs only to be mopped with clear, lukewarm water to remove all trace of dirt. Regular buffing, plus occasional waxing, keeps it sparkling.

It's beautiful! Gloss and colors of WRIGHTFLOR are rich and *permanent*—they go all the way through the tile. Marbleization is uniform, rhythmical, interesting in pattern.

It's resistant to damage! High-modulus, non-porous WRIGHTFLOR is compounded entirely of non-fibrous ingredients, molded under unusually high pressure. As a result it is resistant to chemical attack and identation. Abrasive particles cannot penetrate its surface and there is no factory-waxed surface to wear off.

And it lasts! Floors of WRIGHT RUBBER TILE, heavily traveled for over 28 years, still look like new. And, remember, because of Wright Manufacturing Company's practice of continuing research and improvement, today's WRIGHTFLOR resists wear even better than the earlier long-wearing WRIGHT RUBBER TILE. No other proved floor covering can compare with WRIGHTFLOR in heavy traffic service!

Send today for free samples of WRIGHTFLOR, together with details on characteristics, standard architects specifications and the name of your nearest dealer.

WRIGHT MANUFACTURING COMPANY
5204 POST OAK ROAD • HOUSTON 6, TEXAS

WRIGHT RUBBER TILE

2467

FLOORS OF DISTINCTION

- WRIGHTEX—Soft Rubber Tile
- WRIGHTFLOR—Hard Surface Rubber Tile
- WRIGHT-ON-TOP Compression Cove Base

THE RECORD REPORTS

CANADA

(*Continued from page 188*)

Government Criticized on Certain Housing Policies

Members of the Dominion Mortgage and Investment Association — life insurance companies, loan and trust companies — take a hefty swing at certain government policies in their 1949 annual report.

While doing more than $330 million in mortgage loan business last year — 10 per cent over 1948 — the Association is looking into the future, and it's not too happy with what it sees.

While approving recent rent increases, the Association delivers a short jab at government-sponsored easier credit terms. It believes these can mean only one thing — another upward hike in the cost of housing. And if costs go higher, the demand for housing may fall.

The Association points out that the cost of mortgage loans is about the only item that has gone down.

"Today," the report states, "a person wishing to build a house can secure a $1000 loan requiring a monthly installment of only $5.05, whereas the monthly installment in 1939 would have been $6.58. The reduction is due to a combination of a lower rate of interest and longer amortization.

"The Association in recent years has warned of the danger of too easy mortgage credit and of encouraging people acquiring homes to assume too large a burden of debt. Loans now being made under the National Housing Act are very high by any standard. There would perhaps be little ground for criticism if government action in the housing field had been confined to assisting those people in the lowest income groups. But the lowest income groups have received little assistance."

A quick blow is tossed at the amended N.H.A., which places Central Mortgage & Housing Corp. in direct competition with builders in constructing houses for sale, and with investors in building rental housing. In the view of the Association, the government — rather than Parliament — has taken a dangerous amount of power into its hands. The report ends with a final punch: "The time has come to call a halt to the encroachments of governments into the field of housing."

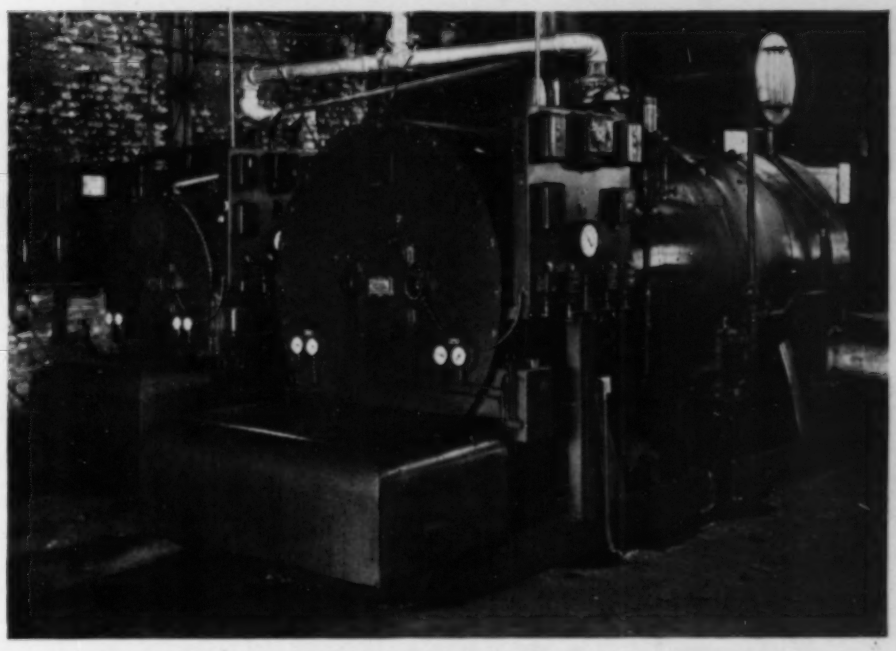
SAVE *better than a $1000 a month*

SAVE LABOR — SAVE FUEL — SAVE COSTLY MAINTENANCE

Actual case histories of two Steam-Pak installations at the Monon Railroad, Indianapolis and Lafayette.

HOW MUCH CAN YOU SAVE BY INSTALLING A STEAM-PAK GENERATOR

Buildings at Monon Railroad Roundhouse requiring steam from the York-Shipley boiler illustrated at right.



Monon Railroad has made labor savings of more than $1,000 per month on the York-Shipley self-contained Steam-Pak boiler units at Indianapolis and Lafayette, Indiana. Pictures above show installation at Indianapolis.

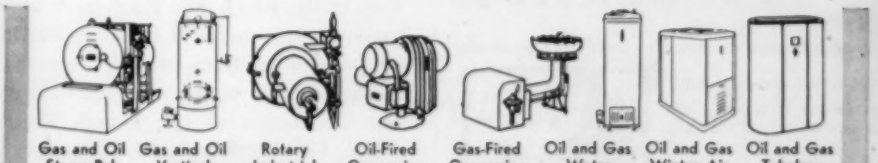
Steam-Pak Generators are built in capacities from 15 h.p. up, for low or high pressure steam or hot water, for light or heavy oil, combination gas and oil, or straight gas.

Can you save money with a Steam-Pak? There is one way to find out . . . ask a Qualified Heating Engineer. Your York-Shipley Distributors are thoroughly qualified to analyze your problem and determine savings. See your nearest York-Shipley Distributor or write, wire or 'phone.

YORK-SHIPLEY

INDUSTRIAL DIVISION

719 Jessop Place, York, Pennsylvania — 'Phone 7861



Gas and Oil Steam-Pak Generators | Gas and Oil Vertical Boilers | Rotary Industrial Oil Burners | Oil-Fired Conversion Burners | Gas-Fired Conversion Burners | Oil and Gas Water Heaters | Oil and Gas Winter Air Conditioners | Oil and Gas Tubeless Boiler Units

YORK POWER INDUSTRIAL DIVISION — YORK HEAT RESIDENTIAL DIVISION

Write for Case Histories on How Others Save Money

PRODUCTS
(*Continued from page 143*)

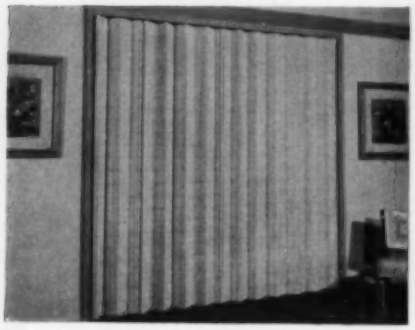
cabinet is green enamel finished, and measures 35 in. high, 21 in. wide, and 60 in. long. The gross boiler output is 120,000 Btu per hour. An electrical delay switch is claimed to completely eliminate smoke on start, and an electrical solenoid valve is said to eliminate smoky shut downs. Bethlehem Foundry & Machine Co., Bethlehem, Pa.

Gutter Guard

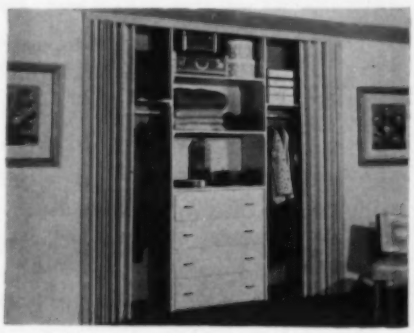
Rain-L-Flo Gutter Tube is designed to prevent leaves and trash from blocking gutters and downspouts, insuring free drainage and eliminating need for gutter cleaning. The tube is 3-in.-diam fine-mesh bronze screen, with internal brass wire spring. It comes in 5-ft lengths, packed 60 ft to the carton. Installation is said to require only laying the tubing end to end in any type gutter, then telescoping the ends together with about 2 in. overlap at each connection. Outer ends are sealed by flattening and folding under. The tube is flexible, and is said to bend around any corner. No tools are said to be needed except a pair of shears for installing. Wynnco Products Corp., 344 Luckie St., N.W., Atlanta, Ga.

Flexible Doors

Ra-Tox Flexible Doors, made of woven wood splints, are designed primarily for home or apartment use as doors for walk-in closets, room partitions, and similar applications. The doors are adaptable also for use in schools, churches, institutions, industrial and commercial buildings. They are made of basswood splints, $\frac{7}{8}$ in. wide by $\frac{1}{10}$ in. thick, running vertically in the door. The splints



Flexible wooden splint doors save space, allow free air circulation. They may also be installed as folding room-partitions



are woven together with a tough seine twine such as is used in fish nets. Finishes include a range of 11 standard lacquer enamel colors, including a natural finish which shows the natural graining and tone of the wood. The doors have been made in sizes up to 14 by 20 ft. Panels are suspended from ordinary traverse channels. The woven structure allows free circulation of air. Hough Shade Corp., Ra-Tox Div., 1045 Jackson St., Janesville, Wis.

(*Continued on page 194*)

Follansbee Seamless Terne Metal Roofing

for eye-catching roof design

Roof design is not limited to one pattern when you specify Follansbee Terne Metal Roofing. In fact, you can select a design detail to conform to the architectural style of the building.

That's just one of the many advantages of Follansbee Terne Metal Roofing; others you'll want to consider include—

- *color harmony with building trim*
- *long-term economy of terne metal roofing*
- *lifetime fire-resistant construction*

Follansbee Terne Metal Roofing has earned its reputation for permanence as a result of the records on Follansbee roofs still in service after more than half a century. This experience assures you of client satisfaction when you specify this quality metal roofing.

If you'd like to know more about these veteran roofs just write Terne Metal Div., Follansbee Steel Corporation and we'll send you details.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLUE SHEETS • SEAMLESS TERNE ROLL ROOFING

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va.

FOLLANSBEE METAL WAREHOUSES

Pittsburgh, Pa. • Rochester, N.Y. • Fairfield, Conn.

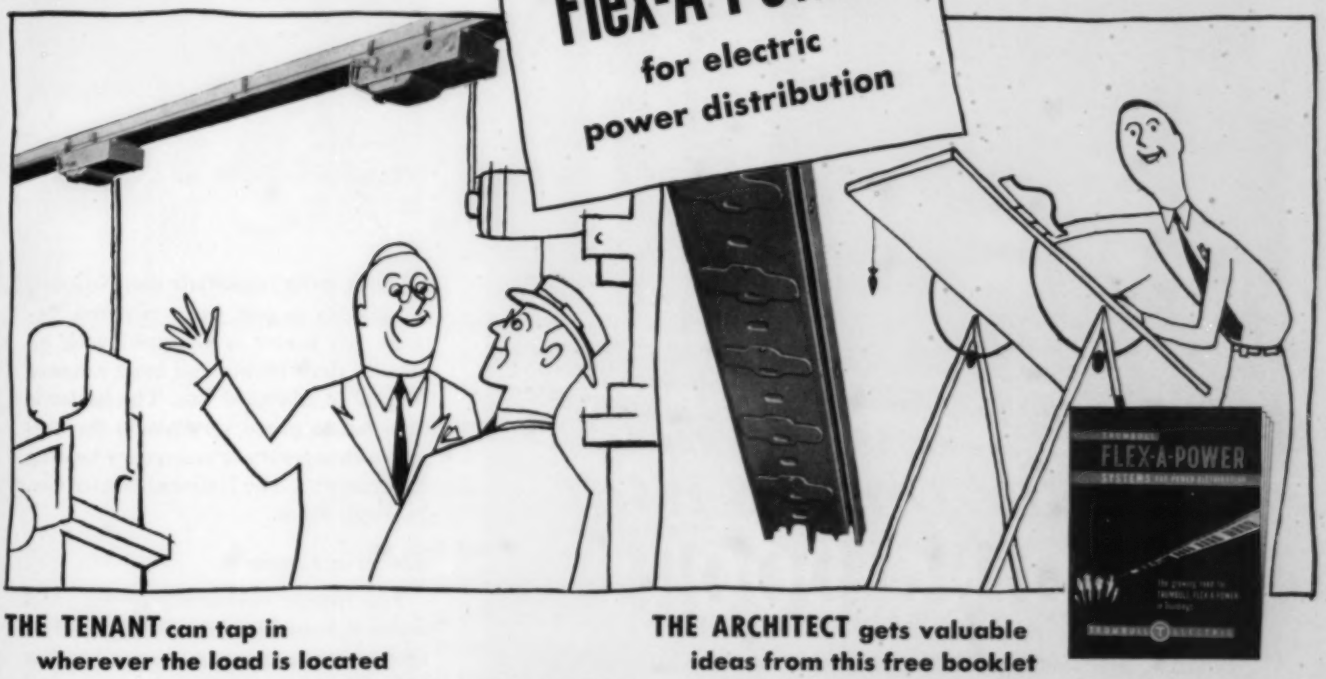
Everybody saves money when you pick Flex-A-Power* for electric power distribution

THE BUILDER finds it easier to install than wire and conduit

Pre-fabricated busway sections are easily connected in any arrangement and in runs of any length. LVD (low voltage drop) for main feeders and risers (600-4000 amp, 600 v), FVK for secondary feeders (225-1000 amp, 600 v), LTG for light-duty services (50 amp, 300 v).

THE OWNER gets flexibility without extra investment

With FLEX-A-POWER there's no costly investment to anticipate future needs. Sections can be added, subtracted, rearranged or even dismantled and relocated—easily, quickly.



THE TENANT can tap in wherever the load is located

No need to locate loads near fixed outlets or to use long extension wires. FLEX-A-POWER provides outlets along its entire length—15 for every 10-ft section of FVK . . . and LTG can be tapped by plug or trolley at *any* point.

*Reg. Trade Mark

THE ARCHITECT gets valuable ideas from this free booklet

Write for it. It gives the reasons why Trumbull FLEX-A-POWER was selected for such modern buildings as Hotel Roosevelt, New Orleans; Rike-Kumler's department store, Dayton; Hartford Fire Insurance Co.; University of Washington Medical School. Write for Bulletin TEM-1. THE TRUMBULL ELECTRIC MANUFACTURING COMPANY, Plainville, Conn.

TRUMBULL (T) ELECTRIC

TRUMBULL'S TRAINLOAD OF NEW PRODUCTS

PRODUCTS

(*Continued from page 192*)

Reciprocating Compressors

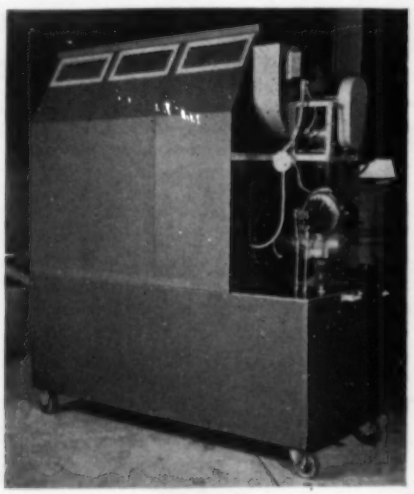
Two new models of large *Carrier* reciprocating compressors have been developed to meet commercial air conditioning and refrigeration application needs from 100 to 150 horsepower in single units and designed to operate with a variety of refrigerants — Freon 12, Freon 22, or ammonia. They can be used either direct or belt driven, powered by motor, gas or Diesel engine, or steam turbine with gear. The units can be adapted for operation as dual units from a single motor with a double shaft.

The Model 5J40, a 4-cyl machine, uses Freon 12, and has a nominal cooling capacity of 100 tons for air conditioning and 65 tons for refrigeration, or using ammonia, for refrigeration duty, 60 tons.

The Model 5J60 has 6 cyl, and capacities of 150, 100, and 90 tons respectively under the above conditions. Both machines are designed for compactness, with weight and vibration greatly minimized, and can be mounted on upper floors without massive foundations. Carrier Corp., Syracuse, N. Y.

Portable Industrial Heater

The National Heater Co. announces a direct-fired industrial heating unit that is completely portable. The heater is mounted on rollers, and has a self-contained fuel tank. It is shipped assembled as a package unit, and requires only plugging in for immediate use. No stack or chimney is said to be required, because the heater is equipped with an induced draft blower and has a range of 200,000 to 1,800,000 Btu. The heater is expected to prove very handy for uses such as temporary or emergency heating requirements. The National Heater Co., St. Paul, Minn.



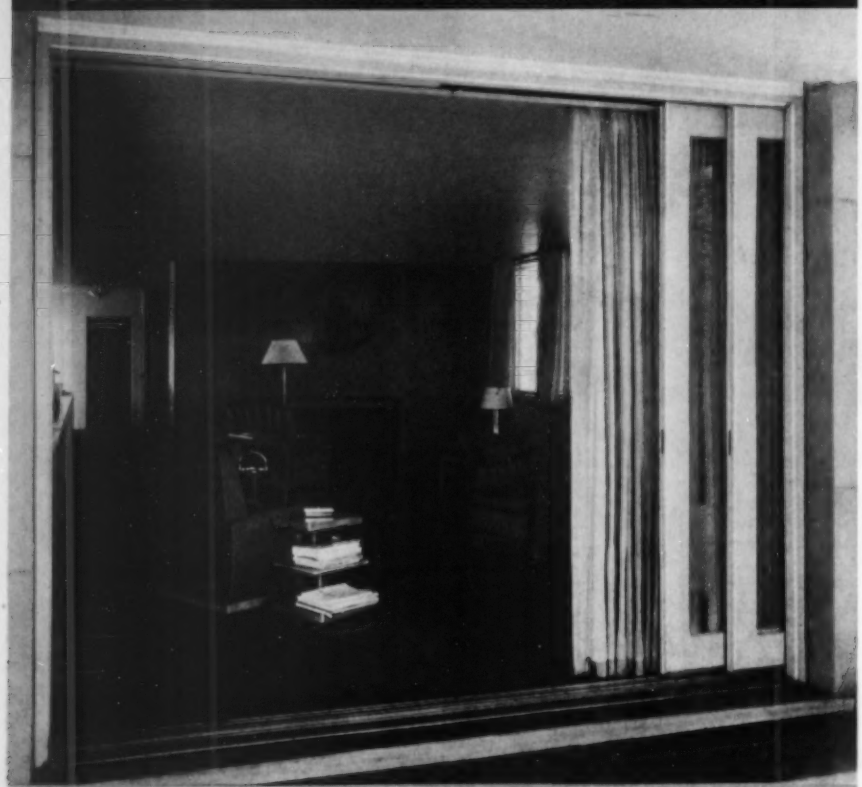
Portable heater for use as needed

Electric Eraser

The *Handee* electrically driven hand eraser is available with an optional foot speed control, claimed to permit freedom of both hands in handling the eraser, and an absolute control of speed in on and off position with the foot. The device weighs 12 oz, and has a special chuck which accepts any of the standard erasers. All moving parts, except the rubber eraser, are covered by a protective sleeve. The manufacturer claims that the unit will make smooth, clean erasures without smudge on tracings and drawings. Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago 7, Ill.

(*Continued on page 196*)

WEATHER STRIPS FOR SLIDING DOORS



PROPERTY OWNERS WANT SLIDING DOORS

"Accurate" patented Metal Weather Stripping for sliding doors definitely answers every requirement. All over America, "Accurate" Sliding Door Weather Stripping is the recognized material to do this job *right*.

ACCURATE

Write us for working drawings to fit your immediate needs. Or, if you prefer,

ASK FOR ILLUSTRATED FOLDER

ACCURATE METAL WEATHER STRIP CO., Inc.

215 EAST 26th STREET, NEW YORK 10, N. Y.

You don't have to shop around... Allegheny Stainless is produced in every form you may need

YOU see, we operate a sort of stainless steel supermarket. You name it, we make it . . . wire, fine wire, bars, shapes and tubing—sheets, strip and plates, both clad and solid—castings and forgings of any description . . . *everything* you may need!

It's a good thing to know, that *one* reliable brand—Allegheny Metal—can satisfy *all* your wants in stainless steel. It's time-saving and advantageous in many ways to have a single, dependable source of supply, with one undivided responsibility and one well-known standard of quality and uniformity.

What's more, with every pound of Allegheny Metal comes the extra value of experience—the rich background of the *pioneer* stainless steel—and that can save you money, too!

Complete technical and fabricating data—engineering help, too—yours for the asking. W&D 2312

ALLEGHENY LUDLUM STEEL CORPORATION

The Nation's Leading Producer of Stainless Steel in All Forms

AL

Pittsburgh, Pa. . . . Offices in Principal Cities

Allegheny Metal is stocked by all Jos. T. Ryerson & Son, Inc., Warehouses

PRODUCTS

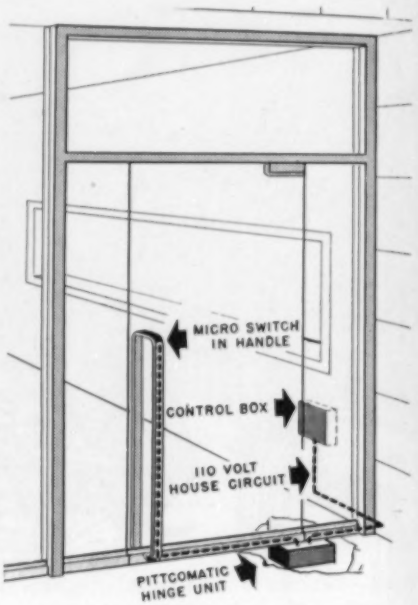
(*Continued from page 194*)

Cabinet Unit For Heating and Cooling

The *Modine Cabinet Unit* for heating and cooling is designed for space heating and cooling of commercial and public buildings, such as stores, offices, schoolrooms, etc. The unit is equipped with blower fans which draw room air into the unit through an inlet grill, pass it through a heating or cooling coil, and deliver it to the area served. The equipment may be used with or without ducts. It can be mounted on the floor, wall or ceiling, recessed in the wall, or concealed behind a wall or false ceiling. The unit may be used for heating with steam or forced hot water; for cooling with chilled water; or for both heating and cooling with water. Resilient rubber mountings and isolation of motor and fans are said to prevent transmission of noises and to assure vibrationless operation. For fresh air introduction in ventilation applications, a non-freeze coil (for heating) and a plenum base with built-in, manually operated mixing damper can be supplied. Cabinet enclosures are finished in beige-grey baked enamel. Modine Manufacturing Co., Racine, Wis.

Automatic Door Opener

The *Pittcomatic Hinge* unit is a new double-acting power hinge, operated by a compact electric-hydraulic mechanism. A 10-volt micro-switch in the door handle actuates the hydraulic action when the handle is touched. The door operates in either direction depending on whether the handle is pulled or pushed.



Touch on handle activates new door

The power unit consists of a ⅓-hp, 110-v, 60-cycle motor bolted to a housing containing an internal gear pump, solenoid-operated hydraulic valve, filter and an adjustable pressure relief valve.

A control box, containing an electronic timing relay, permits a choice of operations and speeds, and also provides for remote control of the door where desired.

Two types of installation are available for the hinge. Type A is a self-contained hinge and power unit. It is installed in the floor under the door, and connected by regular 110-v current to the control box. Type B is a remote installation. The hinge under the door is connected to a separate power unit by hydraulic lines. Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Pa.

(*Continued on page 198*)

HERE'S AID TO ARCHITECTS and THEIR ENGINEERS in planning SOUND SYSTEMS!

ARCHITECTS and their engineers are invited to make full use of the experience of RCA Sound System engineers and the great RCA research and engineering laboratories, in planning and engineering sound systems.

You can get practical help on sound systems for every type of building: Schools . . . Hospitals . . . Hotels . . . Factories and Offices . . . Churches . . . Department Stores . . . Airports and Terminals . . . Warehouses and Garages . . . Auditoriums . . . Recreational Centers . . . Institutions . . . Stadiums.

• • •

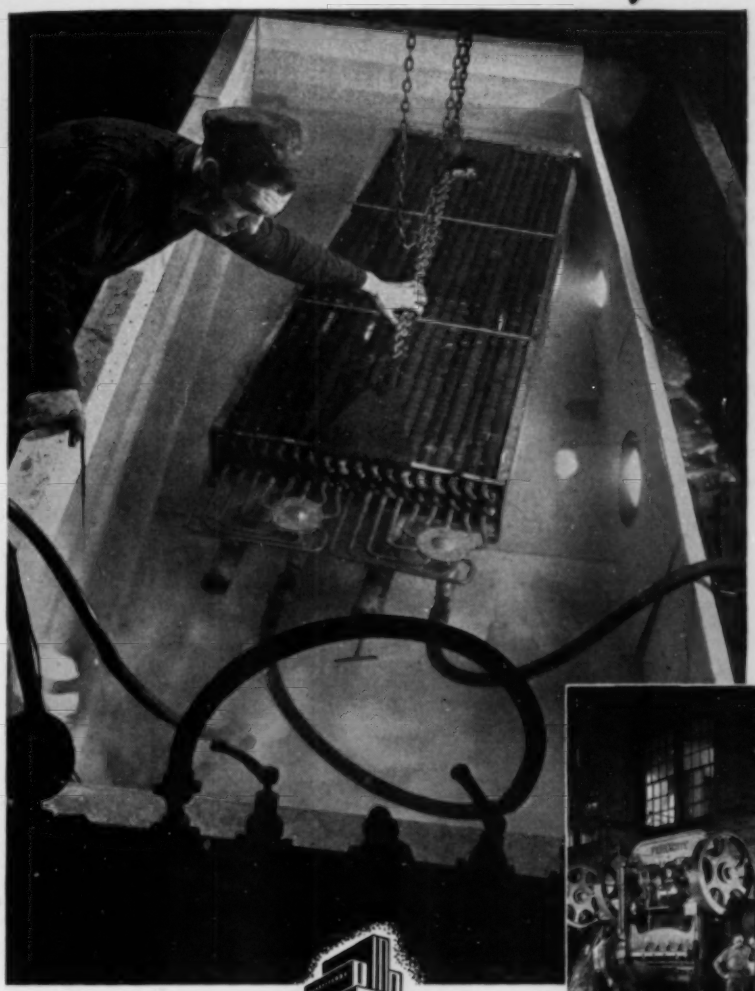
Call on RCA Sound System engineers while your plans are still in formative stage. *No obligation, of course.*

SOUND PRODUCTS 3-G
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

Please have one of your sound system engineers call on us.

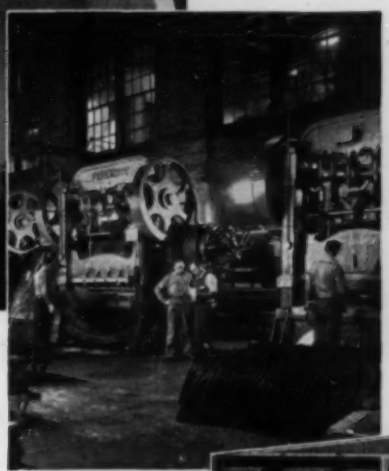
NAME_____
FIRM_____
STREET_____
CITY_____ STATE_____

Here's the Story ON AEROFIN...

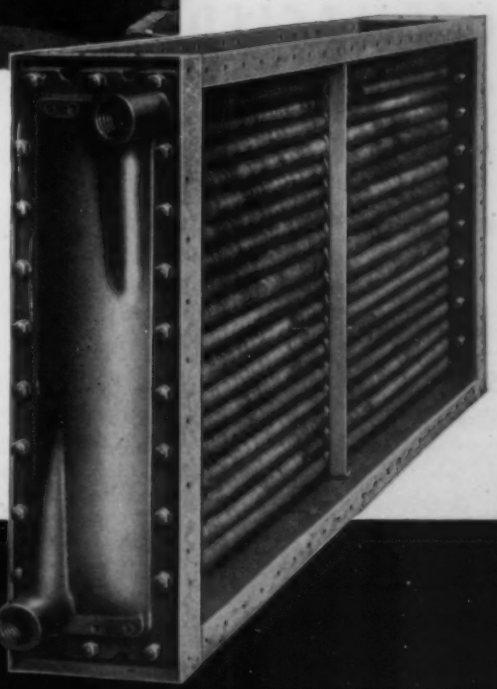


This man is completing one of the many tests used to control the quality of Aerofin finned heat-transfer surface. He is looking for air bubbles in a specially illuminated tank. If there are no bubbles, it means the immersed Aerofin unit has withstood the terrific strains of steam and hydrostatic pressure tests and is ready to give you long, efficient service.

Such rigid specifications and inspection, backed up with over 25 years of experience in manufacturing finned heat-transfer surface, assures you of Aerofin dependability, durability and maximum efficiency.



Aerofin is devoted exclusively to the production of finned heat-transfer surface. This specialization enables Aerofin engineers to select just the right surface and materials for the job, enables expert workmen to assemble these materials into a highly efficient unit.



The end result of Aerofin research, engineering and specialized production is the Aerofin Finned Heat-Transfer Unit. Day after day, thousands of units like this one demonstrate their superiority under the most severe conditions. Complete research and accurate ratings allow you to install Aerofin at full rating with confidence. You can depend on Aerofin to give you long, efficient service.

Throughout the Air Conditioning Industry—

Aerofin units do the job Better, Faster, Cheaper

AEROFIN CORPORATION

410 South Geddes St., Syracuse 1, N. Y.

NEW YORK CHICAGO CLEVELAND DETROIT
PHILADELPHIA DALLAS MONTREAL

PRODUCTS
(*Continued from page 196*)

Welded Steel Continuous Framing

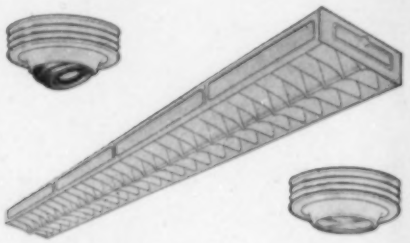
The new publishing plant for the Baltimore Sun being erected in Baltimore is said to be one of the largest welded structures erected in recent years. The six-story-high building, designed by consulting engineer Van Rensselaer P. Saxe of Baltimore, will have a floor area of 325,000 sq ft, and will contain 2200 tons of steel.

Welding is reportedly being used because of the steel tonnage saved, and because the continuous welded structure uses shallower beams. These welded beams require less fireproofing, reduce dead weight, permit smaller story heights. Noise is eliminated during erection.

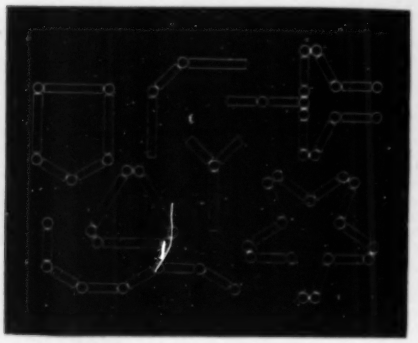
All welding is being done with 16 400-amp *Lincoln* welders and $\frac{3}{16}$-in.-diam *Fleetweld No. 5* electrodes. The large size electrode used on all joints is claimed to make possible an average speed of metal deposit per operator of 17 to 20 lb per day. The Lincoln Electric Co., Cleveland 1, Ohio.

Lighting Fixtures

The *Day-Brite Plexoline* lighting fixtures are said to allow the use of curves and angles of any degree in the layout of slimline and fluorescent illumination. The system is made up of three basic units: linear sections, circular accent units, and adaptor units. No special or custom made parts are said to be needed.



Round and linear fixtures (above) combine to form various lighting patterns (below)



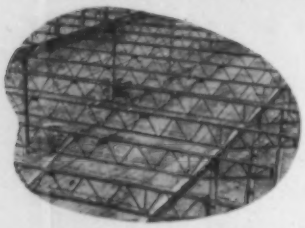
The circular accents provide pivots for the formation of angles with the linear sections. The linear sections are louvered, and are available in 4-, 6-, or 8-ft lengths, and for two or four lights. Circular units have luminous sides, either fixed or adjustable lenses, and come in 15- or 21-in. diam. All units are finished in white enamel. Day-Brite Lighting, Inc., 5465 Bulwer Ave., St. Louis 7, Mo.

Combination Siding

Bird Master-Wall Siding is said to combine the application of insulation, sheathing and exterior finish in one application. The product was designed for use on small houses, camps, garages, warehouses and all types of utility buildings. The material is a lamination of 2 half-inch-thick insulating boards, offset to provide double tongue and grooved vertical and horizontal joints.

(*Continued on page 200*)

FOR STRENGTH... ADAPTABILITY... ECONOMY...



Campbell 66 Motor Terminal
Swan Const. Co.
R. X. Grueninger, Arch.

Bettendorf Super Market
Dickie Const. Co., Wischmeyer and Lorenz, Arch.

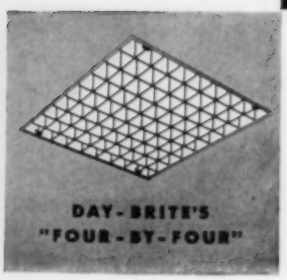
USE LACLEDE STEEL JOISTS

- **FASTER CONSTRUCTION** — Light . . easily handled . . prefabricated to speed the job.
- **ADAPTABLE** — They combine efficient structural function with architectural versatility.
- **ECONOMICAL** — They assure more room at less cost. Their high strength plus light weight provide substantial savings in foundation and framework, and utility conduits, pipes and lines are easily threaded through the open webs.

Specify These Laclede Products For Your Construction Needs
Multi-Rib Reinforcing Bars . . Steel Pipe . . Steel Joists & Nailer Joists . . Welded Wire Fabric . . Form & Tie Wire . . Round & Square Spirals . . Conduit . . Corrugated Steel Centering . . Electrical Weld & Gas Weld Tubing.

LACLEDE
Producers of Construction Steel
LACLEDE STEEL COMPANY
St. Louis, Mo.

Alameda Road Shop, Singer Sewing Machine Company, Kansas City, Missouri



FOUR SQUARE FEET OF DE LUXE LIGHTING

Here's modern, distinctive lighting that only the word "fine" describes.

FINE IN ARCHITECTURAL POSSIBILITIES . . . the Day-Brite "Four-by-Four" unit . . . a whole host of wonderful new lighting patterns for store, office, lobby ceilings at the command of your imagination . . .

FINE IN ENGINEERING . . . integrated lighting design advanced to a new high peak of efficiency . . .

FINE IN QUALITY . . . performance and durability second to none . . . sensationally simple maintenance . . . all the *value* that famous Day-Brite quality guarantees.

"DECIDEDLY BETTER"
DAY-BRITE
Lighting Fixtures

PREMIUM QUALITY WITHOUT PREMIUM COST

037

The entire fascinating "Four-by-Four" story is yours for the asking. Write today for Bulletin 20-C.

037

Day-Brite Lighting, Inc., 5465 Bulwer Ave., St. Louis 7, Mo.
In Canada: Amalgamated Electric Corp., Ltd., Toronto 6, Ontario

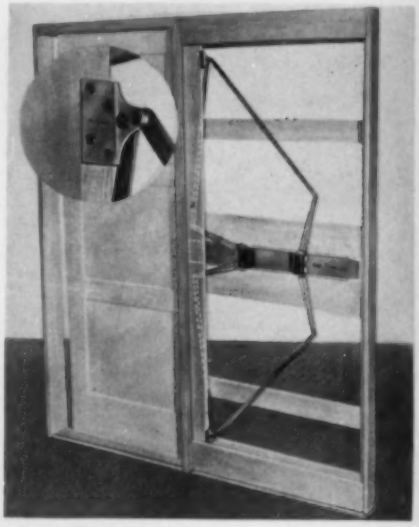
PRODUCTS

(*Continued from page 198*)

It is applied to studs set in usual manner. The wood fibre insulation board is protected by specially treated penetrating asphalt. The siding is claimed to be extremely rigid, termite resistant, and mildew proof. It is available in brick, stone and shingle designs, and a wide array of colors and blends. No painting is said to be necessary. It is also claimed to be unnecessary to have joints fall on studs. Panel sizes are 43 ¾ by 21 ⅜ in. Bird & Son, Inc., East Walpole, Mass.

Trackless Unit For Sliding Doors

The *Flo-Dor Trackless Unit* for recessed sliding doors is said to provide free-floating action without tracks or alignment problems. The complete installation, including mechanism, is said to fit within standard 2 by 4 studs, with ample clearance for a standard thickness



Metal arms support trackless sliding door

door. Operation is claimed to be easy and silent. The trackless units are available to fit all standard door sizes, and permit doors to travel full width of the opening. Flo-Dor, Inc., 8831 Exposition Blvd., Culver City, Calif.

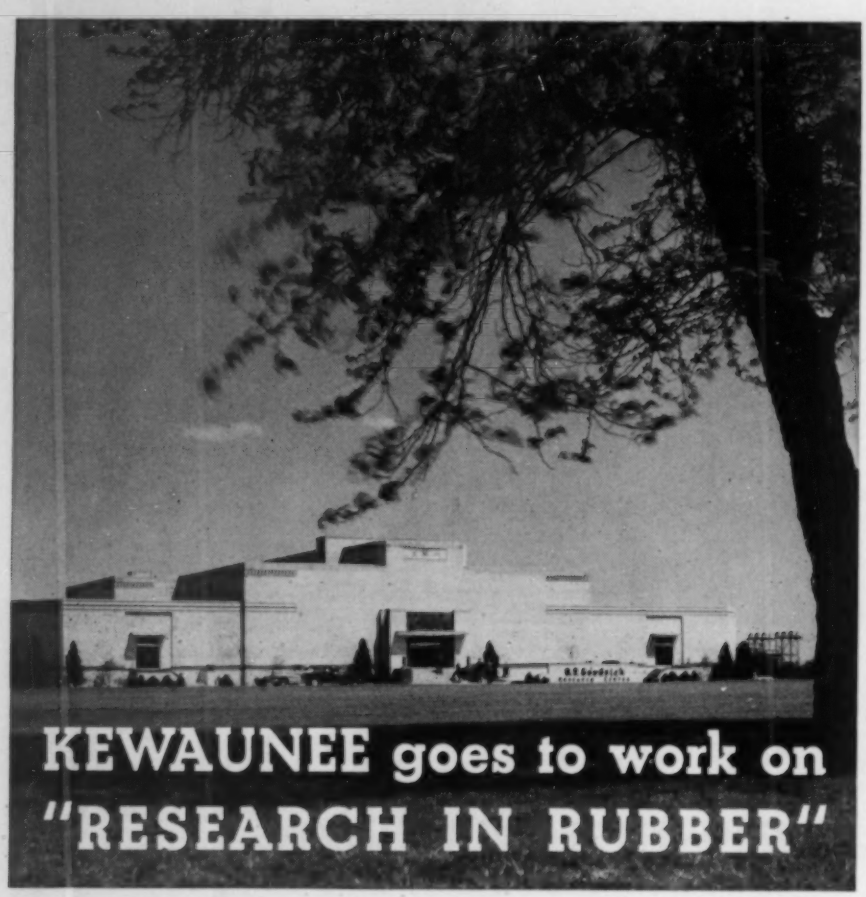
Solar Charts

The *Solar Shadowgraph* comprises a series of charts designed to give information needed for various architectural design problems involving solar exposures, supplementary solar heating, sheltering overhangs, air conditioning and related solar problems. Charts are available for any location in the temperate zones. Each gives length and direction of sun shadow at any time of day or year. They are direct-reading and require no computation for application. Other charts in the series give solar elevation, solar azimuth, and sun ray angles. They are available on 8½ by 11 in. cards. Kayess Enterprises, Box 366, Station A, Palo Alto, Calif.

Concrete Form Calculator

The *Keely Plyform Calculator* is said to provide quick, easy specification-use data on proper plywood thickness, spacing and size of studs, wales and ties based on hourly rate of pour, for the design and construction of plywood concrete forms. Operated as a slide rule, it is said to calculate for both vibrated or unvibrated concrete at 50 or 70 F. The devices measures 3 by 8 in., and is printed in three colors on plastic. Also included is a small folder on design assumptions. Douglas Fir Plywood Assn., Tacoma 2, Wash.

(*Continued on page 202*)



KEWAUNEE goes to work on "RESEARCH IN RUBBER"

New B. F. Goodrich Laboratory is Kewaunee Equipped

Kewaunee Laboratory Furniture is designed and engineered to fit practically any industrial research program or laboratory requirement. That's one reason why B. F. Goodrich chose Kewaunee for its new Research Center at Brecksville, Ohio.

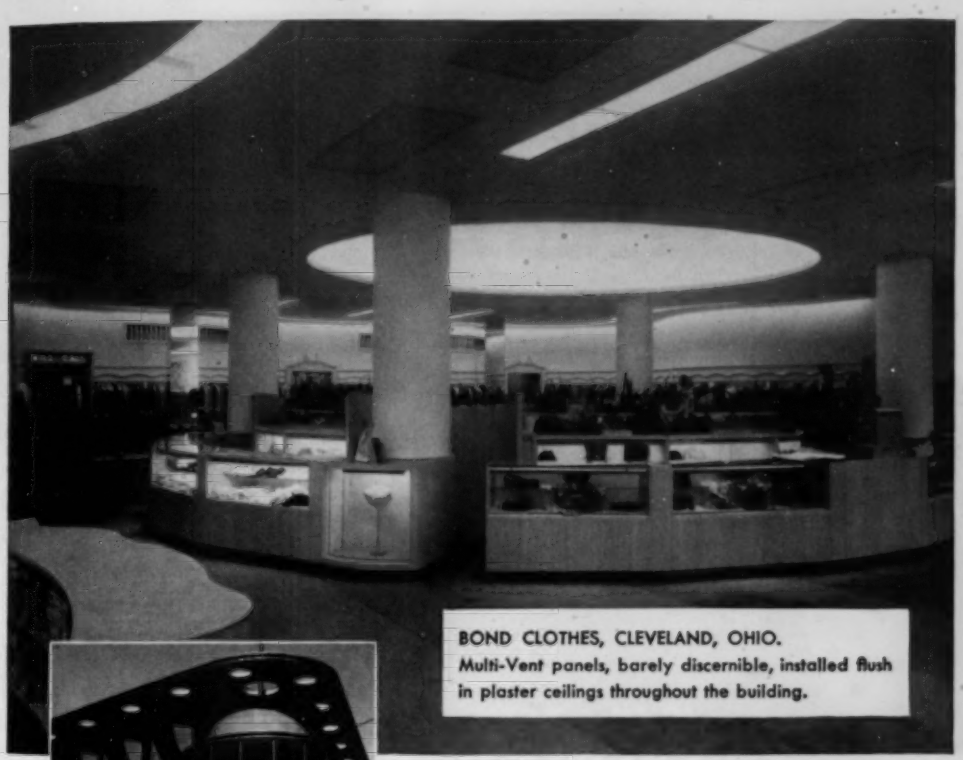
The new Kewaunee metal units are heavier and sturdier than ever, with new, huskier door and drawer suspension. Metal surfaces are Bonderized. Working surfaces are Kewaunee's KemROCK — resistant to acids, alkalies, solvents, and ordinary physical shock.

Through and through, Kewaunee is custom quality — at ready-made prices. Write for full details. No obligation.

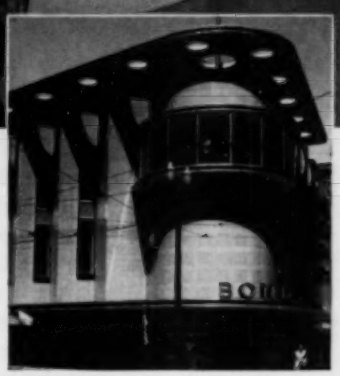
Kewaunee Mfg. Co.
C. G. Campbell, President
5046 S. Center St., Adrian, Michigan

Representatives in Principal Cities •

For *complaint-free* low velocity air distribution

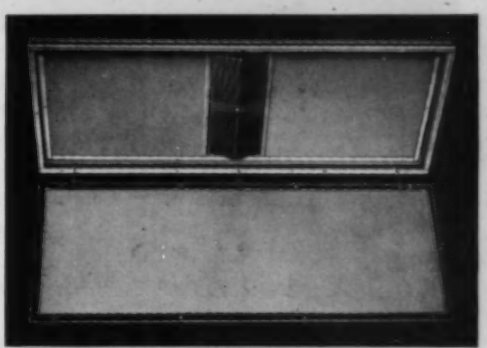


BOND CLOTHES, CLEVELAND, OHIO.
Multi-Vent panels, barely discernible, installed flush in plaster ceilings throughout the building.



Use the Best...

Use
MULTI-VENT *Ceiling Panels*
T.M. Reg. U.S. Pat. Off.



Though the cost of supply and return air outlets is a very small percentage of the overall cost of a good air conditioning system, economizing in the selection of air distribution media is often the cause of complaints from clients on drafts, uneven temperatures, insufficient air, noise and dirty ceilings.

Multi-Vent is better able than any other diffuser to provide widespread uniform air distribution, without these common objectionable conditions because the basic draft, noise and dirt hazards, inherent in all other diffusers, are non-existent in the unique Multi-Vent principle of *distributing air entirely by displacement rather than by high velocity injection.*

In distribution by displacement there are *no* strong air streams to aim and *no* change in air flow pattern when air supply is varied. Regardless of room size, ceiling heights and relative positions of partitions, beams, etc., *all problems of outlet location and air direction adjustments for throw and drop to avoid drafts are eliminated.*

Multi-Vent, moreover, can handle greater amounts of air in proportion to room size than any other diffuser and still maintain a rate of air motion low enough to meet not only the most exacting comfort zone requirements but also to solve the high load and high ventilating problems in critical laboratory and industrial processing areas.

Multi-Vent has many other advantages such as savings in basic heating, cooling and air handling equipment in addition to the important installation, maintenance and decorating economies.

Write for detailed literature and the name of our sales engineer in your vicinity.

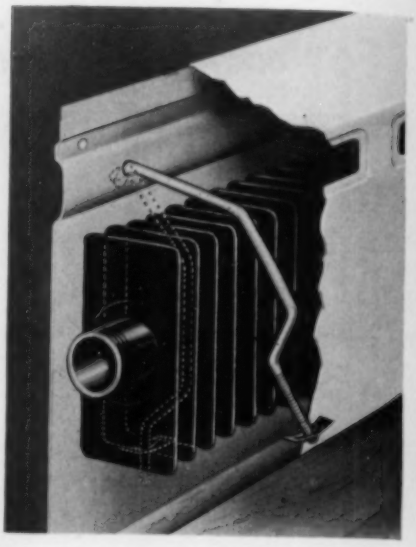
MULTI-VENT DIVISION • THE PYLE-NATIONAL COMPANY 1375 N. KOSTNER AVE., CHICAGO 51, ILL.

YOUR ENTIRE AIR CONDITIONING SYSTEM WILL BE JUDGED BY THE PERFORMANCE OF THE OUTLETS

PRODUCTS
(Continued from page 200)

New Hangers For Radiant Baseboard Heaters

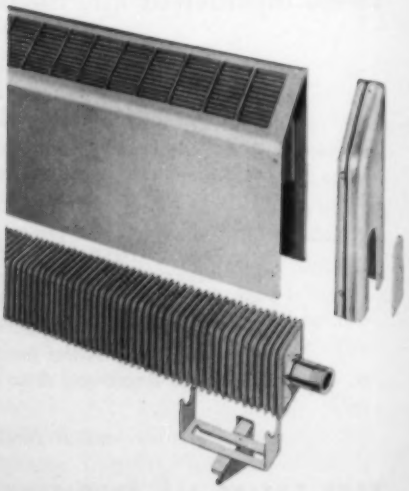
The new *Vulcan Rod Hanger* is said to speed up installations of Vulcan radiant baseboards by suspending the radiation coils directly from the backing, which is an integral part of the installation. This reportedly eliminates the spotting and drilling of holes and insertions of screws often required. The backing is provided with knockouts through which the rod hangers are inserted. The rod is then pushed down between fins, and a speed nut is fitted against the bottom of the fins. It is said to provide for easy adjustment of pitch of the radiation unit, and give ample allowance for expansion. The hanger is made in 1- and 1¼-in. sizes and can be used for non-recessed or semi-recessed installations. The Vulcan Radiator Co., 26 Francis Ave., Hartford 6, Conn.



Rod hanger is adjustable, easily installed

Another new hanger is featured in the cabinet design of the *Trane Wall-Fin* radiant baseboards. The hanger consists of a cradle supported by a bracket, which is bolted to the cabinet backing. The cradle rides with the expansion and contraction of the heating element. This feature is claimed to prevent damage from buckling, loosened supports and other stresses. The cabinet itself is available in standard unit lengths that lock together with push-in rivets. Lengths run from 2 to 6 ft in 6-in. increments, grilles from 2 to 10 ft in 6-in. increments. Steel pipe and non-ferrous heating elements are available in standard lengths from 2 to 12 ft. The Trane Co., La Crosse, Wis.

Cradle hanger rides with heater expansion



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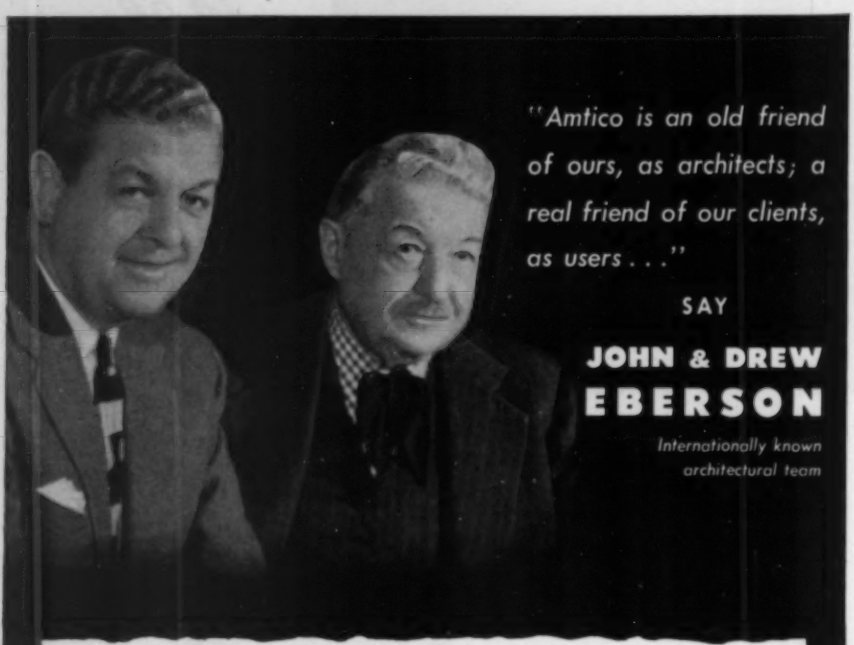
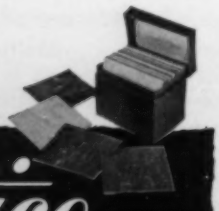

"Amtico is an old friend of ours, as architects; a real friend of our clients, as users . . ."
SAY
JOHN & DREW
EBERSON
Internationally known architectural team

The life-expectancy of an AMTICO Rubber Flooring installation is at least that of the building where it is used. AMTICO floors 30 years old show no perceptible wear. Cleaning and maintenance costs are minimized. These factors, plus design flexibility, comfort, quiet and fire-resistance, account for AMTICO's frequent use by architects of theatres, churches, institutions and commercial buildings.

SAMPLES ON REQUEST
A free box of 4" x 4" samples of Amtico in standard ⅛" gauge and all 23 colors sent, with illustrated literature, on request. (Write Dept. AR-4)



Amtico
RUBBER FLOORING

AMERICAN TILE & RUBBER COMPANY, TRENTON 2, N. J.
In Canada—American Tile & Rubber Co., Ltd., Sherbrooke, Quebec

They'll say "GOOD-BYE" to bills like these when you specify SILENTITE Windows!

Year after year, home-owners will thank you for selecting Silentite Windows—because of the bills they *don't* have to pay!

Gone forever are the extra fuel bills caused by heat-leaking, draft-inviting windows. That's because Silentite Windows are *insulated*—made with patented "floating" weatherstrips and many other weathertight features. Silentite is a Wood Window—which means extra insulating value.

There are fewer cleaning bills, too, in a house with Silentite Windows. Dust stays out—draperies, walls and furniture need less cleaning.

Silentite Windows are designed and built to give a lifetime of smooth operating service. They take and hold paint lastingly. They cannot rust or corrode. They do not encourage condensation.

We believe Silentite is today's most *modern* window—and invite you to get all the facts. It is also made in casement styles.

Curtis Companies Service Bureau
AR-7S Curtis Building
Clinton, Iowa

Gentlemen: Please send me book on Silentite Windows, including casements. I am ( ) architect, ( ) contractor, ( ) prospective home builder, ( ) student. (Please check above.)

Name.....

Address.....

City.....State.....

Curtis makes a complete line of architectural woodwork for the modern home. Make your next home "all Curtis."

1856 CURTIS WOODWORK
SILENTITE
PRE-FIT
the *Insulated* window

PRODUCTS
(*Continued from page 202*)

Dampproofing Materials

Two new products are announced for dampproofing masonry walls. *Carey Plasterbond* is produced for coating interior surfaces of exterior masonry walls above grade. It is said to be a non-fibrous liquid asphalt compound, free of coal tar, which dries with a tacky, elastic film that permits plastering after 24 hours. The manufacturers claim that it may be used with or without furring, will not bleed through plaster.

The second product, *Carey Foundation Coating*, is said to resist seepage of underground moisture through exterior masonry or concrete walls below grade. Made of a blend of asphalt, solvents and resins, it is said to dry to a durable film capable of withstanding normal exposures and temperature changes. Both products come ready to use; require no mixing, heating or special tools, and can be applied by brush or spray. The Philip Carey Manufacturing Co., Cincinnati 15, Ohio.

Miniature Sound Level Meter

The new *Type 410-A Sound Level Meter* is flashlight size, and reportedly measures quickly and accurately indoor and outdoor sounds. Simple controls are said to allow operation by non-technical personnel. The meter weighs slightly over 2 lb. Readily available batteries are said to have a normal operating life of 50 hours. Optional accessories include carrying case, extension cable with input adaptor and mounting tripod. Vibration pickups and integrators are available for measurement of displacements, velocities, and accelerations in the audio frequency range. Hermon Hosmer Scott, Inc., 385 Putnam Ave., Cambridge 39, Mass.

Small sound level meter is easy to operate

Waterproofing Solution

Stopall, type C and CP, a clear waterproofing solution which contains General Electric silicones, is used for keeping water out of concrete and cinder blocks, porous stucco, and sandlime brick. Its use is said to permit oil painting on concrete with lasting results. From 100 to 150 sq ft of wall can be covered with 1 gal of the solution. Blocks treated with the solution have reportedly withstood 5 days of severe water sprays and heat cycles which the manufacturer claims is the equivalent of from 12 to 15 years of normal weathering. Twelve days after these tests, the blocks were said to be still dry. Stopall Waterproofing Manufacturers, Inc., 306 Commerce Bldg., Kalamazoo, Mich.

(*Continued on page 206*)

METALAB

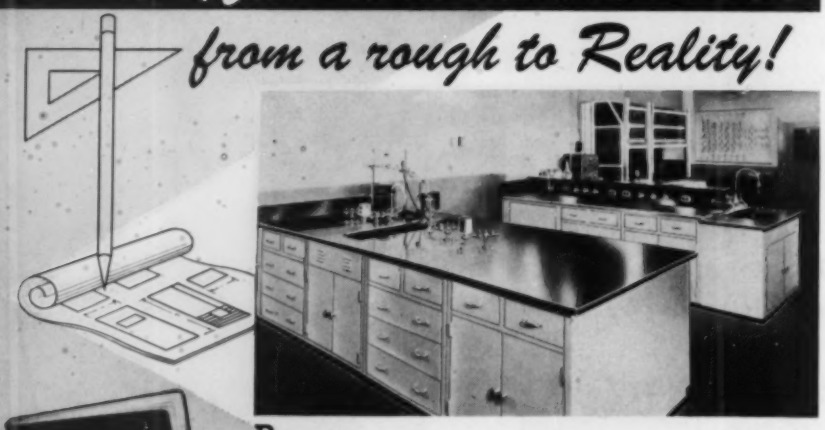
LABORATORY FURNITURE and EQUIPMENT

Used in Many of the Nation's Finest Laboratories Because of these Superior Features:

- Interchangeable Sectional Units — adaptable to Modular Planning.
- Functional Design — Standardized units for every need.
- Rugged Construction of protective lead-coated steel and stone.
- Built for permanence — fireproof, waterproof, corrosion resistant.
- Most Economical in cost — the result of METALAB specialization.

YOUR *New* LABORATORY . . .

from a rough to Reality!



Send for this new Complete Catalog on Laboratory Furniture and Equipment.

Planning a new Lab? Adding to your present equipment? Metalab will give you expert advice on:—

- How to plan your lab for operating efficiency
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- How to get the most for your laboratory budget

Our superior manufacturing facilities result in *top quality and economy*—features which have made Metalab the choice of many of the nation's leading laboratories.

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SECTIONAL LABORATORY FURNITURE and EQUIPMENT by

METALAB Equipment Corp.

1530 Dean St., Brooklyn 13, N. Y.

Modine Presents
A Great New Cabinet Unit for
HEATING and COOLING

HIGH CAPACITY HOT WATER HEATING—new specially designed water coil permits 2 lbs. steam performance on 180° water.

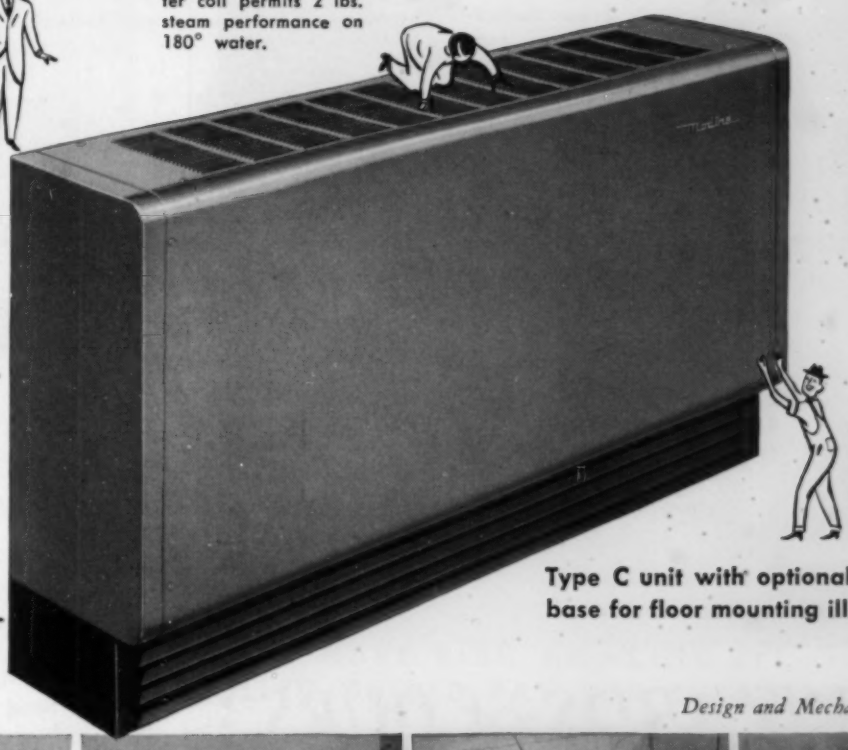
YEAR 'ROUND COMFORT — a single unit for forced hot water heating . . . chilled water cooling. Steam models for heating only.

GOOD LOOKING — smartly styled and finished in beige-gray enamel. Louvered base in darker color. Parker-Bonderized for lasting beauty.

FRESH AIR VENTILATION—available with non-freeze steam coil and built-in mixing damper for ventilating applications.

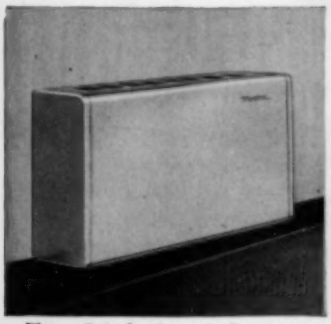
EASY ACCESSIBILITY—entire front panel removable for complete accessibility to motor, blowers, coil and piping.

QUIET OPERATION — hushed performance . . . skillful silencing of mechanical and air-rush noises.

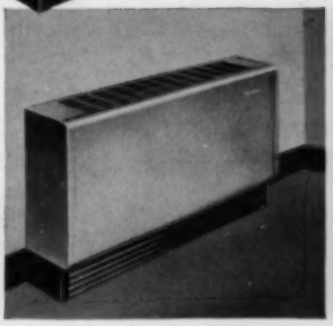


Type C unit with optional plenum base for floor mounting illustrated.

Design and Mechanical Patents Pending

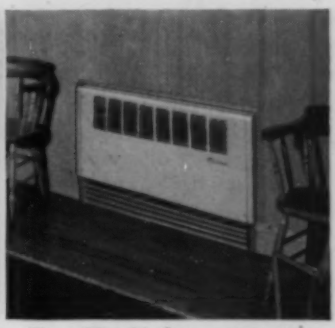


Type C is basic unit for wall mounting. Accessory equipment adapts it to other installations.



Attractive louvered plenum base (optional) attached on job, makes Type C a floor-mounted cabinet.

Optional inlet grille converts Type C to a ceiling cabinet. Duct connectors can also be furnished.



Type CR with face outlet grille and plenum base available at a slightly higher price for recessed installation.

QUICK, positive distribution of heated or cooled air is yours with the new Modine Cabinet Unit. Quiet efficiency, attractive appearance and quick response to automatic controls make it ideal for stores, showrooms, schools, lobbies . . . all modern commercial and public buildings. Available in 5 capacities from 120 to 640 Edr.

WRITE FOR NEW BULLETIN 550 TODAY! You'll find your Modine representative listed in the classified section of your phone book. Or write direct. Modine Mfg. Co., 1510 Dekoven Avenue, Racine, Wisconsin.

Modine
CABINET UNITS
FOR HEATING & COOLING

U-1063

PRODUCTS
(*Continued from page 204*)

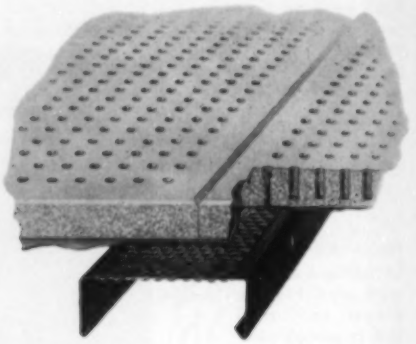
Clear Coating for Concrete Floors

W & W Vinyl Clear Coat is said to be a tough, quick drying coating for concrete floors. Designed principally for use in schools, factories and stores, the surfacing is said to have great resistance to wear. The clear coating can be applied within four hours after application of the traffic primer, and the floor opened to traffic within two hours. It is said to resist gasoline, oils, greases, animal fats and many chemicals. The Wilbur & Williams Co., Greenleaf and Leon Sts., Boston 15, Mass.

Metal Furring Channel

A new type of metal furring channel, called *Screwlock*, is designed for all types of suspended ceiling construction and for fastening all types of materials with screws. The channel is of 26-gage metal, 2¾ in. wide, and perforated with depressed openings formed in such a way as to avoid flat spaces between them. Screws are said to be guided into holes automatically by this device, and not to jar or spring loose due to vibration or shock of added loads or structural adjustments of the building.

A special hanger clip attaches the channel to wood, steel or masonry; a coupling joins channel lengths. The system permits replacement of single acoustical tiles without disturbing the remainder of the ceiling installation. Acoustical tile can be cemented directly to the channel, bonded by the depressed perforations.



Channel depressions guide screws in place

In applying wall materials, the same basic channel can be used. Attachment can be made to hollow tile, concrete, brick or other material with fasteners especially designed for the purpose. Nailock Steel Div., The Sanymetal Products Co., Inc., 1698 Urbana Rd., Cleveland, Ohio.

Home Freezers

The new line of *Kelvinator* home freezers includes 6-, 9-, 12- and 20-cu-ft models. All are counter height, chest type, and open from the top. Compact compressor-condenser assemblies are said to permit smaller cabinets for the given interior capacities. All projecting handles and hinges have been eliminated, and the three smaller models have push-button lid locks. The largest model has two separate storage compartments with separate lids.

Model FL-6, with a capacity of 6 cu ft, is 36¼ in. high, 39 in. wide, and 23½ in. deep. Model FR-92 is 9.3 cu ft, 34⅝ in. tall, 42⅞ in. wide and 29⅛ in. deep. The next larger freezer has 12.8 cu ft, and measures 34⅝ by 54 by 29⅛ in. The 20-cu-ft model is 34⅞ by 88¼ by

(*Continued on page 208*)

Executive Office, Cohen Bros. Dept. Store, Jacksonville, Fla. Designer: Charles Bryer, of Amos Parrish & Co., Inc.

The *WIZARDS* of *OURS*

THERE are purists who will probably object to the strain our headline places on academic English. Not so, however, with many of America's leading architects and "blue-chip" companies.

They know the versatility of our wood-wizards. They appreciate the unequalled skill with which this aged-in-the-wood craftsmanship translates the designer's plans into enduring reality.

However, a splendid reputation oft carries misconceptions with it. Those who have not worked with us may fall into the error of anticipating our estimate. There's a happy surprise in store for you . . . *we're also wizards at flattering your budget.*

Write to Dept. A for our Portfolio of "Jobs Well Done." It's worth seeing.

Bergen-sure the success of your modernization program with

BERGEN CABINET

Architectural woodwork that makes the designer's plan an enduring reality

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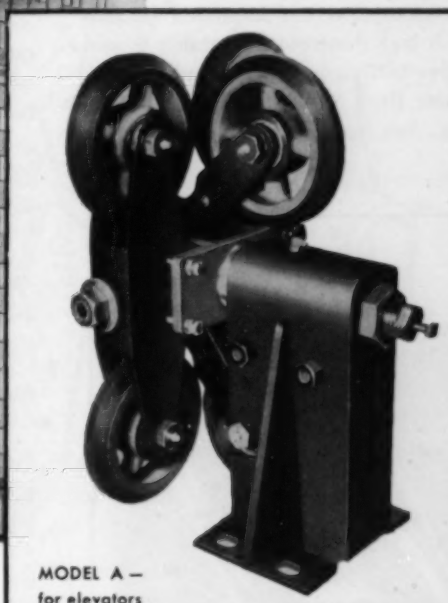
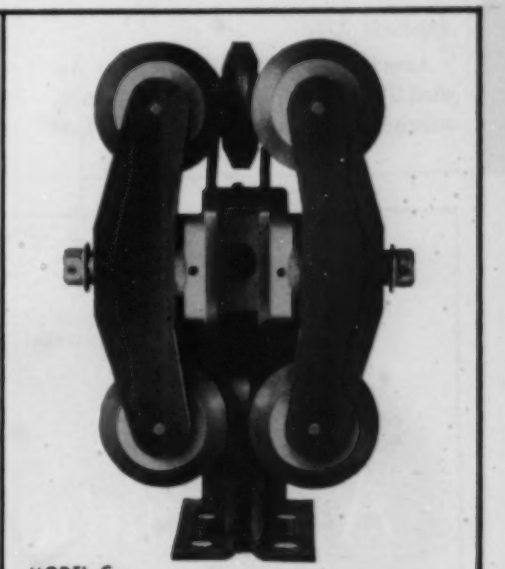
Phone: PResident 2-3121

ELIMINATE THE GREATEST FIRE HAZARD IN YOUR BUILDING WITH ELSCO SAFETY ROLLER GUIDES



MODEL A —
for elevators



MODEL C —
for counterweight and low rise, low speed elevators

It is common knowledge that in the event of fire, elevator shaftways with inflammable oil and grease, act like flues and are the greatest factor in the rapid spread of fire. Dry rails and shaftways are the modern and only proper way of elevator operation. Modernize your elevators, save life, property and money.

RESULTS HAVE BEEN AMAZING !!!
ELSCO ROLLER GUIDES PAY FOR THEMSELVES

a. With Elsco Safety Roller Guides, hatchways no longer need constant cleaning to remove inflammable grease, dirt, fuzz and filth. There is a large savings in labor costs.

b. Tests on a variety of elevators under a multitude of conditions indicate a savings in electric current of between 24% and 44%, and since elevators consume the largest amount of electricity in buildings, the amount of k.w.h. savings is tremendous. Elsco Roller Guides are an anti-friction device.

c. Elsco Roller Guides solve the problem of badly aligned rails and unbalanced conditions, often saving the cost of new, or costly realignment of old rails. Elsco Guides roll and do not slide. Elsco Guides contain stabilizing springs.

d. Because of dry rails, emergency safety jaws hold better in the event of accident.

e. Elsco Roller Guides give a smooth, gliding ride.

Elsco Safety Roller Guides have been in successful operation since 1941. They have been approved unanimously by the Board of Standards and Appeals of N.Y.C. up to 1200 f.p.m. They are adaptable to passenger and freight elevators regardless of capacity or speed, space permitting. They have been installed in leading buildings from coast to coast, and abroad. They are the only safety roller guide with oscillation, traction and knee action. The yoke affixed between the wheels provides a maximum of safety.

YOU OWE IT TO YOUR BUILDING TO INSTALL THE NEW ELSCO SAFETY ROLLER GUIDES

(Patented and trade mark registered)

For further information inquire of your dealer or

ELEVATOR SAFETY CORPORATION / 165 Broadway, New York 6, N. Y.

SAFETY WITH SAVINGS

PRODUCTS
(*Continued from page 206*)

29¾ in. All freezers are fitted with interior storage baskets. Kelvinator Div., Nash-Kelvinator Corp., Detroit 32, Mich.

Asphalt Tile

Azrock Asphalt Tile and *Azphlex Asphalt Tile* are made with a new formula utilizing pulverized, inert Tremolite Talc together with asbestos as the mineral aggregate. The binders are of natural asphalt and coal tar resins, blended with petroleum-derived plasticizers. This formula is claimed to make a tile that is extremely stable, dense, and highly resistant to acid and alkali. The product is further said to have an excellent surface finish, bright and clear colors, less moisture absorption, and improved durability. A high dimensional stability is said to give better resistance to indentation. Uvalde Rock Asphalt Co., Frost Bank Bldg., San Antonio, Tex.

To those who have made possible

our years of growth—architects,

engineers, builders and hardware dealers—

we extend deepest gratitude

on the occasion of the Fiftieth Anniversary

of our Company.

The
Oscar C. Rixson Company
4450 CARROLL AVENUE • CHICAGO 24, ILLINOIS
ESTABLISHED 1900

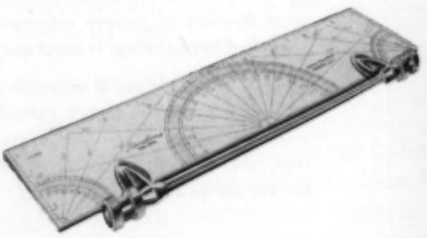
Concealed Hydraulic Door Closer

The *Norton Concealed Door Closer*, a new hydraulic closer, is completely concealed. The unit incorporates the double piston principle with a back check feature, which is said to permit the apparatus to be changed on the job for either left or right hand doors. The closer employs one shaft that runs through the center of a coil to which is attached a ratchet and a gear that moves in two oil-impregnated, self-lubricated bronze bearings.

Power in the new closer is directly supplied through the gearing, which is said to eliminate lost motion and give constant control of the door from a 180 deg opening to the latching position. Norton Door Closer Co., Div. of Yale & Towne Mfg. Co., 2900 N. Western Ave., Chicago 18, Ill.

New Drafting Instrument

A new basic drafting device, called *Paraline*, combines the functions of T-square, straightedge, triangle, protractor, $\frac{1}{32}$-in. scale and parallel rules. Tests were recently conducted by members of the engineering faculty of the University of California, Berkeley, Calif., to rate the instrument in performance and speed against conventional drafting equipment. Subjects experienced in the conventional devices tested, but completely untrained on Paraline, reportedly scored as high or higher on the same test problems with the new instrument. The device was said to be measurably faster than drafting machine equipment for angular line layouts and cross-hatching.



Drafting instrument serves many functions

Paraline is constructed of sturdy transparent plastic, with precision-machined metal rollers, and measures 10¼ by 3$\frac{3}{16}$ in. It is completely self-contained and requires no attachments or board clamps. Loomis Industries, 516 Park Way, Piedmont, Calif.

Expandable Furnace

The *Jackson & Church Four-in-One Budget Furnace* is said to require the

(*Continued on page 210*)

AYE, the manufacturers who put their consumer sales literature in Home Owners' Catalogs are making use of a bright idea — *and* a sales-making service.

How does Home Owners' Catalogs make sales for manufacturers of building materials, equipment, appliances and home furnishings? By accomplishing the following for as little as a thin dime or so per "sales call":

1. Locate and screen prospects who are definitely planning to build new, quality homes for their own occupancy. (This is the job of the Dodge Reports news-gathering staff.)

2. Incorporate in a bound volume the consumer literature of blue chip firms with a stake in the rich residential construction market. Then, deliver this "impactful" volume to qualified home-planners daily and directly.

3. Name Home Owners' Catalogs recipients. What a resultful personal or mail follow-up this feature permits!

For the sake of *your* sales, employ Home Owners' Catalogs!

Home Owners' CATALOGS

119 West 40th Street, New York 18, N. Y.

F. W. Dodge Corporation's Consumer Catalog Distribution Service

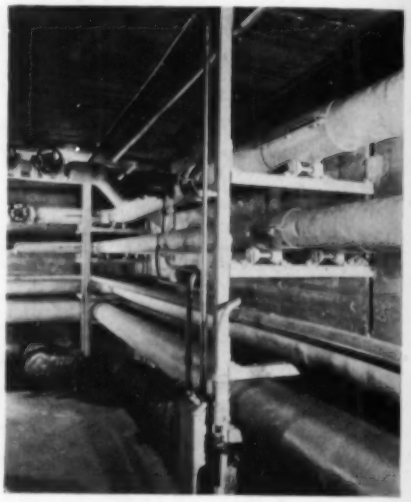
PRODUCTS
(*Continued from page 208*)

addition of only a component package to make it either an 85,000, a 100,000, a 112,000, or a 120,000 Btu output furnace. It was designed especially for houses built with plans for future expansion. The furnace is a package unit with a compact base size of 28 by 37½ in. It may use either gas or oil, and is said to permit change from one to the other as conditions warrant. It is equipped with a 12 gage heat exchanger and fully automatic controls. Filters are of the replacement type, and the blower delivers 1070 to 1500 cfm. Motors are ⅙ to ⅓ hp for output desired. The cabinet is of rust resistant steel finished in baked-on enamel. Jackson & Church Co., Furnace Div., Saginaw, Mich.

Framing for Heavy Piping

A relatively new system of framing, the *Unistrut* steel channel and fittings, has been adapted recently to the task of supporting heavy piping runs in a large tunnel installation at G. D. Searle & Co., Skokie, Ill., manufacturers of pharmaceuticals.

The stanchions were fastened on the job to continuous concrete inserts embedded in the ceiling and walls and bolted to the floors. Pipe was then installed on roller pipe supports fitted to the horizontal framing members.



Steel channels make flexible pipe supports

The system used in this tunnel installation is said to have a number of features. The structure is flexible, in that variations in pitch or slope are permitted by loosening the bolts which clamp the framing members together. No special tools are said to be required. Cost saving is reported in the reduction of detailing time, and the elimination of need for drilling or welding. Unistrut Products Co., 1013 W. Washington St., Chicago 7, Ill.

Deodorizing Lamp

A new G. E. lamp bulb is said to give off small concentrations of ozone sufficient to mask odors in areas of up to 1000 cu ft. The 4-w lamp is less than 1½ in. diam., and operates on household current. It is used with a ballast in a simple fixture which allows the free escape of ozone but shields the eyes from the ultraviolet energy generated by the lamp. It is expected to be used as a room deodorizer in such areas as kitchens, baths, closets, elevators, recreation rooms, etc. At present they are being used in clothes driers and refrigerators. The lamps also have a mild germicidal effect. General Electric Co., Nela Park, Cleveland 12, Ohio.

(*Continued on page 212*)

Beneath the Beauty you create . . .

and a part of it, is function. Underlying the function, and contributing to it is the quality and the performance of the equipment and materials you specify. That is why, for assurance of complete reliability and of the utmost dependability you will want to specify KENNEDY Valves. KENNEDY offers a complete line of iron and bronze valves in all sizes and for all purposes, backed by seventy-three years of valve making experience. Write for the complete catalog.

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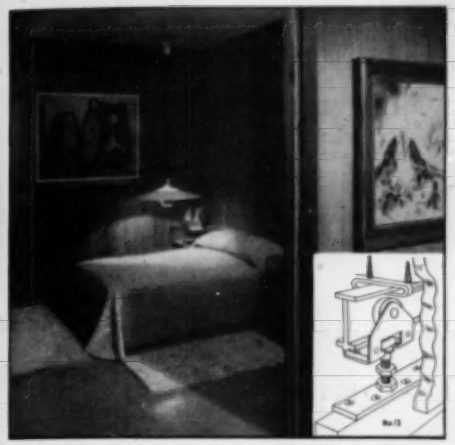
The KENNEDY VALVE MFG. CO.

ELMIRA, NEW YORK

VALVES • PIPE FITTINGS • FIRE HYDRANTS

Save Space & Expense with GRANT



The Woman's Home Companion Exhibition House at the Museum of Modern Art, New York City, features GRANT Sliding Door Hardware and GRANT Drapery Hardware. The living room, dining areas (as illustrated), parents' bedroom (or study-guest room) and the kitchen can be used as one living area, or they can be sub-divided for privacy. The sliding wall between rooms can be left permanently open, or closed to satisfy each family's individual requirements.

Ezra Stoller-Pictor

Pictured here is an actual installation of the GRANT No. 12 Sliding Door Hangers, and the GRANT No. 11 Drapery Hardware. The No. 12 Hangers are engineered for heavy duty operation of top-hung Sliding Doors up to 175 pounds in weight. The No. 12 Hangers are especially suited for homes of contemporary design. GRANT No. 11 Drapery Hardware is ideal for bay windows, wide picture windows, as well as special straight or curved installations.

GRANT also Manufactures:

Sash Pulleys
Drawer Slides
Stage Curtain Hardware
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Hospital Cubicle Hardware

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GRANT PULLEY & HARDWARE CO.

33–37 G"57th Street Woodside, L. I., N. Y.

Representatives in all Major Cities

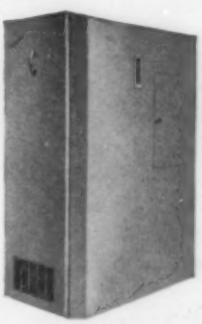
The foremost name in Sliding Devices

2 BURNHAM PRODUCTS THAT PROVIDE LOWER-COST, SPACE-SAVING, RADIANT HEATING SYSTEMS!

BURNHAM'S BASE-RAY* Radiant Baseboards

Lifetime cast-iron baseboard units. Provide radiant heat at ankle height. Fins are part of casting — cannot come loose. No "false front" or grilles to become dented. Easy to install, accessible, leave floor space entirely free. Specify them!

THE PACEMAKER OIL-FIRED BOILER



Lowest priced cast-iron oil-fired quality boiler on the market. Complies with ASME code. Economical in cost because it's shipped assembled — simple to install. Specify it! Team it with BASE-RAY for lowest cost, mid-century radiant heating installations.

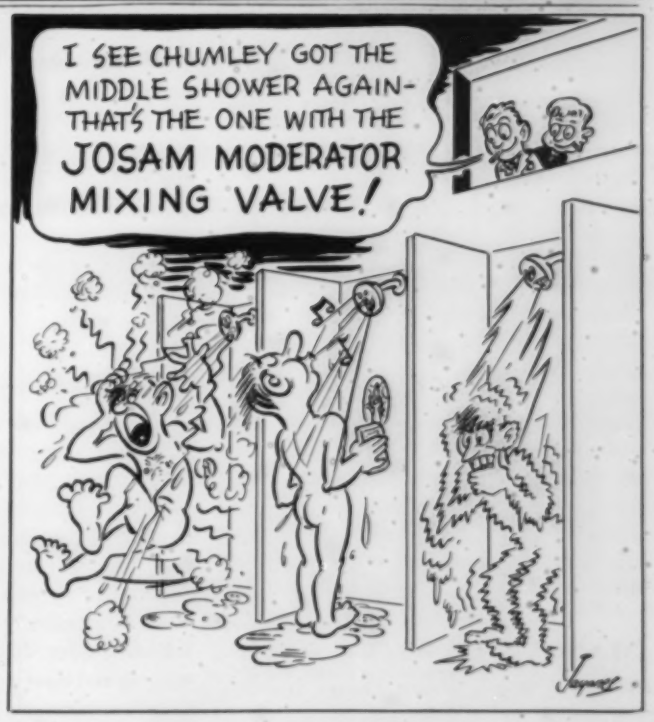
Why specify ordinary heating? Get all the details of this famous team and other Burnham products. Write for Catalog 81 TODAY.

Burnham Corporation

"PIONEERS OF RADIANT BASEBOARD HEATING"

IRVINGTON, N. Y.

*Reg. U. S. Pat. Off.



This situation may get a laugh, but it is a risk you can't afford to take. Prevent accidental scalding by having Josam Moderator Shower valves installed on every shower. Keeps hot and cold water "in balance"—shuts off hot water instantly when cold water supply fails. Write for literature today.

JOSAM MANUFACTURING CO.

302 Josam Building Cleveland 13, Ohio

36 YEARS ON BROADWAY

The hit shows on Broadway last one, two or three years.

The famous Equitable Building, at 120 Broadway, has been a user of Webster Heating Equipment *continuously since 1914.*

This long Webster customer relationship began in 1914 when Ernest R. Graham, Chicago architect, and Thompson-Starrett Co., Inc., New York heating and general contractors, provided a Webster Vacuum System of Steam Heating.

In 1949, after checking with 50 leaders in the building management field, the owners of the Equitable Building decided to install a Webster Moderator System and change over to purchased steam.

Two New York Consulting Engineers, Franklin J. Leerburger and Joseph R. Weiss supervised the program. Heating Contractor Carl E. Joecks made the installation.

If *you* are interested in long, satisfactory service with Webster Heating Equipment, write for the name of nearest Representative.

Address Dept. AR-7

WARREN WEBSTER & CO.
Camden 5, N.J. Representatives in Principal Cities
In Canada, Darling Brothers, Limited, Montreal

WEBSTER
MODERATOR
CONTROL
"Control-by-the-weather"

Architectural Engineering

PRODUCTS

(*Continued from page 210*)

Cabinet Hardware

The new *Streamolife* line of drawer and cabinet door pulls, designed in a simple, elongated teardrop shape, are available in two companion models, identical in contour, but different in proportionate size. The smaller model of the two — Model No. P-1050 — measures 2 in. in overall length, $1\frac{1}{16}$ in. wide, and projects $\frac{7}{8}$ in. The larger, No. P-1051, is 3 in. long, $1\frac{1}{2}$ in. wide, and projects $1\frac{1}{4}$ in. The pulls are made of solid, die-cast metal, finished in chrome plate. They

New cabinet pulls feature simple design

are also available in other plated finishes and synthetic metal coatings. The larger of the models is tapped for two No. 8 screws at $\frac{3}{4}$ in. centers. The smaller pull is tapped for one screw. Burkard Manufacturing Co., 7356 Ten Mile Rd., Centerline, Mich.

Gas Clothes Dryer

The *Sun Dial* single control is featured in the new *Temco* automatic gas clothes dryer. With the device, there is reportedly only one control to set: a sensitive element within the machine detects when clothes are almost dry, and an economizer switch turns off the heat while permitting the tub to revolve 5 minutes longer. The cycle is thus finished with stored heat and brings the clothes to a temperature comfortable for the hands.

An inspection door is located in the top of the counter-height appliance, through which the pilot may be lighted and necessary valve adjustments made. The dryer uses a vacuum drying process,

(*Continued on page 214*)

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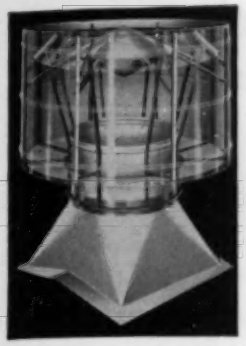

The Burt Free-Flow Gravity Ventilator. It can be converted into the Free-Flow Fan Ventilator by the addition of fan barrel section between head and base.

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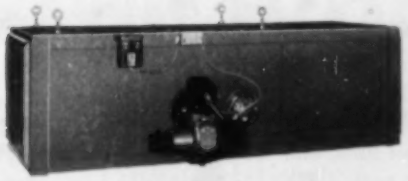

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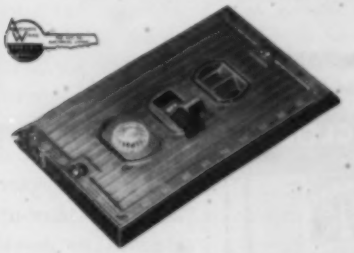

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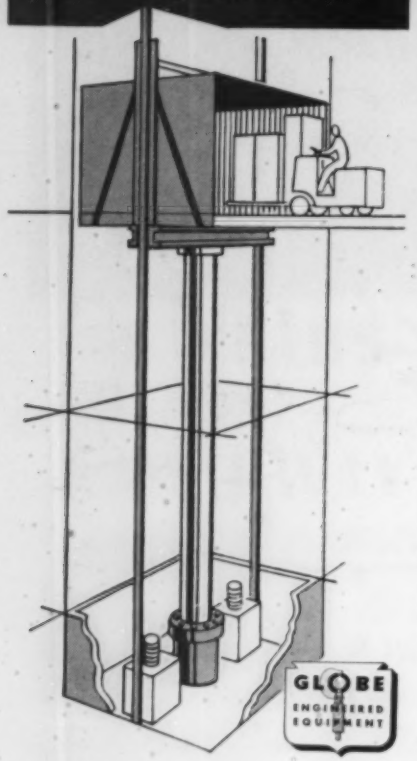

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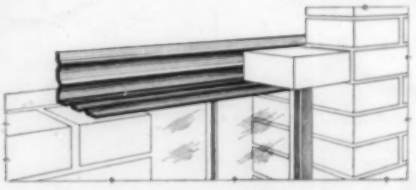
Architectural Engineering

PRODUCTS
(*Continued from page 212*)

and is said to fluff-dry an average load in 35 to 40 minutes. Temco, Inc., Nashville, Tenn.

Prefabricated Steel Lintels

Steelcraft formed steel lintels come in prefabricated stock sizes of 6-in. multiples, to eliminate cutting to individual measurements. Corrugated for extra strength, the lintels are made of 9- and 11-gage steel, and come already painted with a baked-on prime coat. The lintels



Pre-cut steel lintels save on-job labor

may be ordered separately, or in combination with Steelcraft's other products: steel casement windows, door frames, closet doors, basement windows, utility windows, etc. The manufacturers recommend that lintels over all masonry openings such as doors and windows, be at least 8 in. longer than the actual opening, to give a minimum bearing of 4 in. on each side. The Steelcraft Mfg. Co., Rossmoyne, Ohio.

Asphalt Roofing

Sta-Lock Double Coverage Asphalt Shingles have an interlocking design which is said to assure double coverage over 100 per cent of the roof area, and triple coverage over 42 per cent. Each shingle is designed to be secured to roof or adjacent shingles at 8 points for extra wind protection, and to prevent shingle "blow-ups". The design is claimed to provide a distinctive new roofing pattern. It is available in lighter color blends, with a deep-grained texture. The interlock design is claimed to hold together when simply hooked together and held upside down. The Celotex Corp., 120 S. LaSalle St., Chicago 3, Ill.

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The three common causes of wood failure are almost eliminated when you specify pressure treatment with Du Pont Copperized CZC. Because this salt-type wood preservative makes wood unappetizing to termites . . . kills decay-causing fungi...gives a high degree of fire retardance, too.

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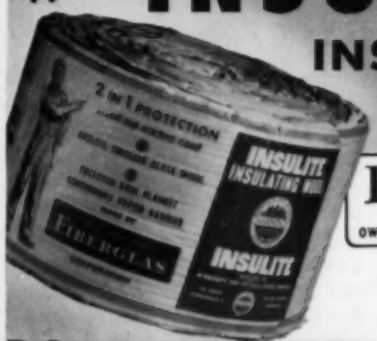

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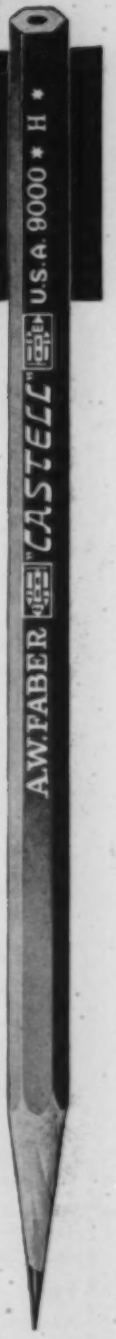

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Architectural Engineering

LITERATURE

(*Continued from page 144*)

trollers are included. Each item is illustrated. Specifications and descriptions also are given. 64 pp., illus. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne and Windrom Aves., Philadelphia 44, Pa.

Projector For Art Work

Artists, Designers, Draftsmen — The Modern Way is to Art-O-Graph it! Folder describes features and operation of a projector device designed for making drawings, layouts, etc. A long list of uses are given, including scaling, reducing, enlarging and rendering finished drawings directly from objects, photos or other copy. 4 pp., illus. J. A. Engel Inc., 624 Syndicate Bldg., Minneapolis 2, Minn.

Decorative Glass

Modernize Your Home With Decorative Glass. Booklet gives patterns and surface finishes available in the line of glass panels. Features and uses of the glass are noted. Many illustrations are given of typical installations, such as partitions and windows, in various rooms of domestic buildings. 12 pp., illus. Mississippi Glass Company, 88 Angelica St., St. Louis 7, Mo.*

Fans and Blowers

How To Have Comfort From Moving Air. Book covers many types of heating, cooling and ventilating equipment employing fans and blowers. It is divided into fourteen sections, each preceded by an illustrated discussion on the installation and use of the type of units presented in that section. The manufacturer of each unit is listed. A preface treats air moving equipment. 136 pp., illus. The Torrington Manufacturing Co., Box 808, Torrington, Conn.

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(*Continued on page 218*)

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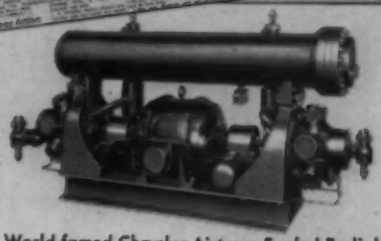

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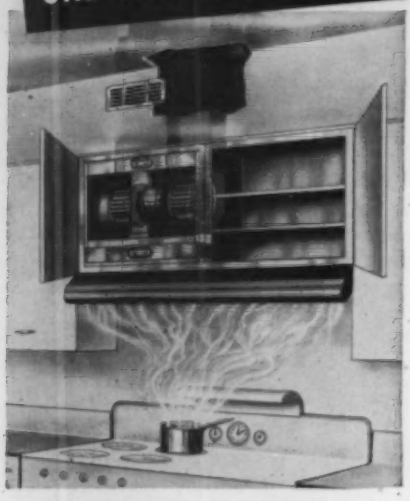

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Architectural Engineering

LITERATURE

(*Continued from page 216*)

stalling counter flashing on concrete or masonry. Each step is described and illustrated with drawings and photographs.

The second booklet describes the features and uses of the sash reglet. Installation methods for concrete and masonry are given. A six-page insert gives details and more installation instructions. 8 pp. each, illus. Fry Reglet Co., 1725 Pennsylvania Ave., Bremerton, Wash.

Kitchen Ventilators

The Most Outstanding Kitchen Ventilators In America. Folder gives features of wall and ceiling type kitchen ventilators. Each model is pictured, and the various assembly parts are discussed. Specifications and installation requirements are given in diagrams and charts. 4 pp., illus. Nutone, Inc., Madison and Red Bank Roads, Cincinnati 27, Ohio.

Drafting Templates

Drafting Templates — Save Time With Rapidesign (Catalogue No. 50). Pictures and describes 30 standard templates for the use of engineers, draftsmen, architects and designers. A great variety of geometric shapes, symbols, equipment and furnishings are included among the templates. A series of special order templates are shown also. 8 pp., illus. Rapidesign Inc., Box 592, Glendale, Calif.

Color In Work Areas

Du Pont Color Conditioning. Booklet gives suggestions for the use of color in industrial plants, schools, hospitals, offices, restaurants, stores, hotels and other buildings. Several characteristics and psychological factors of color are illustrated and discussed. Colors used for safety markings and a list of Du Pont finishes available also are included.

A 25-minute, 16 mm. sound movie in color, called "The Case For Color," is available for showings, without cost, on the same subject. 32 pp., illus. Du Pont Co., Dept. P.R.2, Finishes Div., Wilmington, Del.*

(*Continued on page 220*)

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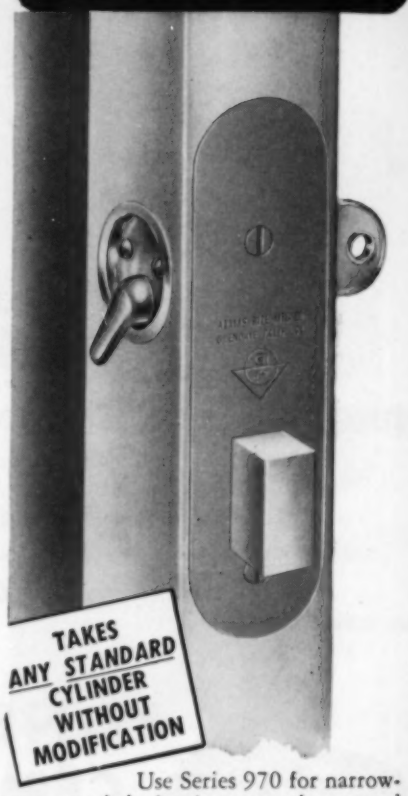

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